Implementation of the South Dakota Diabetes Strategic Plan 2007-2008

Department of Health – Diabetes Prevention and Control Program

Submitted by:

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ABSTRACT

Diabetes has reached epidemic proportions in the United States and is a major public health concern. Poor diabetes management may result in increased morbidity and mortality due to a variety of secondary conditions, e.g., heart disease, hypertension, blindness, renal disease, generalized vascular disease, and nervous system damage. Almost two-thirds of all people with diabetes die from cardiovascular disease, which is the most common complication of type 2 diabetes. Research has indicated that compliance with prescribed treatment plans and maintenance of blood glucose levels helps in reducing the complications related to diabetes. More than 50,000 South Dakotans have diabetes, and it is estimated that many more, including children, adolescents, and adults, will develop diabetes in the future. This translates to an increased need for the provision of specialty health care services for people with diabetes across the State. South Dakota geography and population distribution require significant travel distances for residents seeking health care. Approximately 75% of SD is designated as a health professional shortage area and 11% of South Dakotans lack health coverage.

The South Dakota Diabetes State Plan 2007-2009, outlines 48 objectives within the 10 essential services that are the foundation for public health practice and policy development. The main goal of the SD Diabetes State Plan is to improve access and quality of diabetes health care in the state, by focusing on these objectives. Funded by a SDDOH grant, the University Partners in Health Promotion formed an inter-disciplinary team with faculty from South Dakota State University (West and East River) and the University Of South Dakota School Of Medicine - Nutrition Programs, to address six selected objectives from the Diabetes State Plan. Our work involved faculty, a graduate student, and undergraduate nursing students who worked on the implementation of six selected State Plan objectives: identify barriers to diabetes care and assess the availability of specialty diabetes care in the State, identify diabetes curriculum for the schools of medicine, nursing, and dietetics comparing the content to the ADA standards for diabetes care, revise the Diabetes Information Link program cards, and establish a central depository of information about diabetes related research, collaborative partners and funding sources to be housed on the SDDOH Diabetes Prevention and Control Program's website. A different methodology was developed and implemented to address each one of the objectives. Survey questionnaires and additional instruments were developed to assess barriers to diabetes care, availability of specialty diabetes care services, as well as educational curricula of diverse health schools across the state. People with diabetes (from central, south, south eastern, and north eastern South Dakota), clinics and health organizations, higher education schools, and health professionals who provide services to people with diabetes agreed to participate in this study.

A new version of the Diabetes Link Card Program was developed, and information about diabetes research in South Dakota, and partner organizations, agencies, educational institutions and funding resources was compiled and organized in two tables for future reference. Diabetes curricula from nursing, nutrition, physician assistant and medical schools were assessed and compared to ADA recommendations for diabetes care. Primary gaps identified were: the need

to include specific recommendations on physical activity requirements for diabetics and more information on the effect of stress, illness and trauma on blood sugar, to provide more information on the psychosocial aspect of diabetes and the referral process to other professionals, to increase education about diabetes complications and routine exams such as foot care, eye and dental exams. Additional areas for improvement included more information about preconception care for women with diabetes, diabetes in different settings (such as schools, corrections facilities), and strategies for improving diabetes care in different settings.

The results of this study suggest that the main barriers to diabetes care in South Dakota are health care cost, and insurance coverage, changing lifestyle and behaviors, lack of compliance with treatment and diabetes management plans, lack of awareness on the importance of adherence to self management programs, and about diabetes complications, lack of transportation to access diabetes care and follow up, lack of community resources (such as support groups, diabetes education, nutrition education, access to fitness facilities and physical activities), inconsistencies in health providers communications with their patients, and lack of communication and collaboration among health care providers for follow up care and coordinated care. Additionally, our data indicated that the majority of patients were not consulted about their treatment plan and treatment options. Participants in the study did not feel that the healthcare team addressed the patient's values, beliefs and goals when developing the treatment plan. These barriers correspond with the availability of diabetes specialty services in South Dakota. Although there are community and private clinics in most counties in South Dakota that provide services to people with diabetes such as laboratory tests, and health professionals visits and follow up, our findings show that dietitian and diabetes educator services, as well as eye exams and foot care are not offered on site and patients need to be referred. Therefore diabetes services become fragmented contributing to the sense of lack of communication or miss-communication between health providers, and between providers and clients.

Suggested effective strategies to help improve the perceived barriers to diabetes care include: developing a collaborative relationship among healthcare providers and encourage more effective communication, encouraging patients to participate in group diabetes education to provide anticipatory information and discuss feelings and fears, finding a support person within the patient's social network that would help create a stronger self-management system, and developing exercise and resource facilities for patients with chronic conditions. Additionally, and based on the findings from this study, effective communication between patients and the healthcare team will help in managing the barriers faced by diabetic patients. Identifying individual barriers, creating a support structure, developing inter- provider relationships, and providing facilities and resources within the community will lead to a better understanding and adherence to the patient's overall diabetes care.

Background

Diabetes is the fifth leading cause of death in the United States, and represents a major public health concern. Numerous factors contribute to the development of diabetes, such as individuals' behaviors, lifestyle, environmental conditions (diet, physical activity, overweight and obesity), demographic characteristics and genetics (aging population, race and ethnicity) (USDHHS 2000; CDC 2007; American Diabetes Association, 2007). Poor diabetes management may result in numerous physical complications. The physical burden of this disease includes increased morbidity and mortality due to a variety of secondary conditions, e.g., heart disease, hypertension, blindness, renal disease, generalized vascular disease, and nervous system damage. These complications also represent an economic burden not only for the individuals, but for the communities and the health system as well (CDC, 2007). Additionally, living with diabetes has an impact on an individual's emotional health due to fear of diabetes complications, and decreased perceived quality of life when such complications occur (Debono and Cachia, 2007). More than 50,000 South Dakotans have diabetes, and it is estimated that many more, including children, adolescents, and adults, will develop diabetes in the future. This translates to an increased need for the provision of specialty health care services for people with diabetes across the State. Although the latest data about diabetes management of adult South Dakotans show improvements, some practices such as eye and foot exams are lower than the target indicators for the nation (BRFSS, 2005).

South Dakota (SD) is one of the least densely populated states, 55% of the residents live in rural areas. This geography requires that many residents travel great distances to receive primary and/or specialized health care. The state has 63 hospitals (50 in rural areas), 54 Rural Health Clinics, and 7 Federally Qualified Health Centers that provide services at 37 sites in the state (NC Rural Health Research and Policy Analysis Center, 2007). Almost two-thirds of the state is designated as a Health Professional Shortage area by the federal government; 11% of South Dakotans lack any type of health coverage, and poverty rate in rural SD is 14.8% vs. 12.9% in urban settings (Kaiser, 2004-2005; USDA-Economic Research Service, 2005).

The South Dakota Diabetes State Plan 2007-2009, outlines 48 objectives within the 10 essential services that are the foundation for public health practice and policy development. The main goal of the SD Diabetes State Plan is to improve access and quality of diabetes health care in the state, by focusing on these objectives. The University Partners in Health Promotion has formed an inter-disciplinary team with faculty from South Dakota State University (West and East River) and the University Of South Dakota School Of Medicine - Nutrition Programs, to address six selected objectives from the Diabetes State Plan. Our work involved faculty, a graduate student, and advanced undergraduate nursing students who worked on the implementation of the Diabetes State Plan selected objectives to improve the health of people with diabetes in South Dakota.

Purpose and objectives

The purpose of this project was to implement six selected objectives from the Diabetes State Plan that will contribute to the improvement of diabetes care across the state.

Selected project objectives were:

Approved objective #1: Revise the SD Diabetes Information Link program enrollment cards to distinguish enrollees by age, type of diabetes and ethnicity. (M. Kemnitz, M. Fisher, C. Lammers)

Approved objective #2: Identify barriers to diabetes care and develop strategies to eliminate or lessen these barriers. (H. Samra, K. Kattelmann, C. Anderson)

Approved objective #3: Identify existing diabetes curriculum for schools of medicine, nursing, pharmacy, and dietetics in SD, and compare curriculum content to the American Diabetes Association Standards of Care and identify gaps. (T. Stenvig, M. Kemnitz, M. Fisher)

Approved objective #4: Assess the availability of specialty care for individual with diabetes in SD and identify geographically underserved areas. (C. Sieverson, M. Minton, C. Lammers)

Approved objective #5: Establish a central depository of information, to be housed on the Diabetes Prevention and Control Program's website, about diabetes-related research being undertaken in SD. (M. Kemnitz, T. Stenvig, M. Fisher, C. Lammers)

Approved objective #6: Establish a list of collaborative partnerships for diabetes research across the state, to include researchers, communities, organizations, and funding sources. The final product will be housed on the Diabetes Prevention and Control Program's website. (C. Lammers)

Design and Methods

Co-investigators in collaboration with a graduate student and advanced undergraduate nursing students worked in designated groups. Each group addressed one of the six objectives of the project. The team worked in collaboration with the SD Department of Health/ DPCP (Colette Hesla). While each individual team met weekly or every other week as needed to work in their particular objective, the PI met with each team periodically in order to move forward in their work. Consultations also occurred via phone or e-mail between the PI and co-investigators, and PI-Co-investigators and the DPCP. Depending on the co-investigator primary location (Brookings, Sioux Falls, or Rapid City) meetings were face to face or through phone conferences.

A different methodology was developed and implemented to address each one of the objectives, according to the objective characteristics and desired outcomes. Clinics located in the south, central, and eastern part of the state, that provide services to people with diabetes and health providers were invited to participate to address two of the objectives of the project

that related to diabetes care services availability and barriers. Diverse communities including urban, rural, and American Indian communities were invited and agreed to participate. Institutional Review Board approval was obtained from South Dakota State University, and the Indian Health Services, and a consent form was used before interviewing participants. Data collection was performed through personal interviews, phone interviews, e-mail and self-reported paper and pencil surveys, and from selected electronic data bases depending on each objective. Data collection tools were developed to address each of the objectives. (See Appendices)

Individualized design and methodology for each objective is described below:

Target Objective	Method
Obj. #1: Revise the SD Diabetes Information Link program enrollment card to distinguish enrollees by age, type of diabetes, and ethnicity. (M. Fisher, M. Kemnitz, C. Lammers) *(State objective # 3.7)*	Co –investigators revised the Diabetes Link Card and identified the changes needed in order to address the aspects relevant to the objective: a. Review card format, size, and content to collect additional information on age, race/ethnicity, and type of diabetes. b. The group discussed and evaluated what changes were necessary in the link card to: 1) collect additional demographic information about the participants and 2)collect relevant information about the type of diabetes so that their specific needs could be addressed. This information will allow sending specific relevant information to the participants in the program. Knowledge of the participants characteristics will help tailor the materials they needed (i.e. adolescents' needs will be different from women's or elderly needs; people with diabetes type 1, type 2, or with specific complications may need different information; and pregnant women or women of childbearing age may have different needs). Furthermore, demographic information will provide data regarding who is using the link program, who the program is reaching, and what areas need to be targeted more. c. Make sure participants provide written informed consent to participate in the program and further assessments/surveys to evaluate the program.

	d. Make sure HIPPAA regulations were followed while developing and using the Link Program. Co-investigators consulted with Kevin DeWald from the DPCP at SDDOH about the link card compliance with HIPPA guidelines and the type of data that could be gathered by using this type of mailing. e. The revisions were sent to Colette Hesla and final revisions were added to the final approved version of the Link Card.
Obj. #2: Identify barriers to diabetes care and develop strategies to eliminate or lessen these barriers. (H. Samra, K. Kattelmann, C. Anderson.) *(State objective # 7.2)*	Study co-investigator and advanced nursing undergraduate students worked on this objective during their community health advanced training. From July to December 2007, and January to May 2008, they completed the following steps to address this objective: a. A literature review was conducted focusing on identifying the most common barriers and obstacles for diabetes care encountered by people with diabetes in different areas of the United States, including people from different race/ethnicities, gender, age groups, and living in rural, urban, or frontier areas. (See references) b. South Dakota State University institutional approval (Institutional Review Board) was requested and received, and a consent form was used prior to interviewing the participants. (See Appendix #1) Target population was identified: people with diabetes living in the state of SD, in urban, small and medium rural communities and towns, including underserved communities, and diverse communities such as American Indian and other minority groups in the state. Nursing students performed an assessment of the communities' strengths, resources, and needs, and worked closely with people with diabetes at different geographical sites: a rural clinic in Lincoln County, an urban diabetes clinic Minnehaha County, an urban clinic in Brookings County, and an urban clinic in Minnehaha County that provides care to underserved populations. c. Students interviewed individuals with type 2 diabetes who attended the clinics described above. Interviews were performed after informed consent was obtained, lasted 5-10 minutes and were voluntary. Additionally, key

	informant interviews were conducted with the health providers to assess what they perceived as barriers to diabetes care in the communities they served (2 endocrinologists, a diabetes nurse coordinator, and a nurse administrator). A different instrument was used. (Appendix #2) d. Data collection and Instruments used: Data collection was performed through interviews with patients with diabetes, and patients' charts review at the clinic site. Interviews were performed using the Chronic Care Model as a frame work (The Chronic Care Model, 2007). Additional questions were introduced to address demographic information needed, and completed survey interviews were performed of people with diabetes and key informants (endocrinologists, RN specialized in diabetes and diabetes educators, and nurse administrators). e. Data analysis: frequency and descriptive statistical analysis was performed to report the results. JMP statistical software (SAS Institute, Cary, NC, USA) was used. From January to May 2008 a study co-investigator and the graduate student contacted communities in central, and south central SD, to conduct further assessment on barriers to diabetes care services encountered in other geographic locations of SD. a. South Dakota State University institutional approval (Institutional Review Board) was requested and received, and a consent form was used prior to interviewing the participants. b. Target population: residents of South Dakota living with diabetes type 2 were eligible to participate in the study. Sixty people agreed to participate in the study. They were from 8 different communities from central and central southern South Dakota. c. Instrument used: using the Chronic Care Model as a frame work, an electronic and/or hard copy questionnaire containing 39 questions was given to 60 individuals living with diabetes in the State of South Dakota. Diabetes educators and nurse professionals distributed the survey to their patients. Each professional read a letter to the patient containing information on how to complete the survey. Each participant gave their

	consent and filled out the survey at their discretion. Upon completion of the survey, the patient mailed the survey back to the investigators through a self addressed envelope. In addition to a paper copy of the survey, participants were given the opportunity to fill out the survey through an online resource. The survey questions were divided into four main categories: (i) demographic information; (ii) the type of help the patient receives from their health care team; (iii) an understanding of the diabetes condition; (iv) how perceived barriers affect diabetes care. (Appendix # 3) d. Data analysis: frequency and descriptive statistical analysis was performed to report the results using SPSS version 16 (SPSS, Inc., Chicago, IL).
Obj. #3: Identify existing diabetes curriculum for schools of medicine, nursing, pharmacy, and dietetics in SD, and compare curriculum content to the American Diabetes Association Standards of Care and identify gaps. (T. Stenvig, M. Kemnitz, M. Fisher.) *(State objectives #8.2 and 8.2.1)*	The following steps were performed: a. Co-investigators contacted schools of medicine, nursing, pharmacy, and dietetics in the state, including state, private, and Tribal colleges. In addition to the schools listed in the objective, the Physician Assistant Program at USD was added to the list of schools. b. A key informant from each school was identified who was familiar with the school diabetes curriculum program of study and will provide the information. c. Both undergraduate and graduate curricula were assessed. d. The ADA standards of diabetes care were identified and co-investigators created a matrix of interview questions based on ADA standards of care. The matrix was tested for validity and reliability with one of the schools at SDSU before sending it to the key informants from the other schools. (Appendix #4) e. Key informants were interviewed by phone, in person, or via e-mail, to assess: diabetes content within the educational curriculum, how the content reflects ADA recommended standards of diabetes care, time spent teaching diabetes related topics, and planned clinical experiences within the respective curriculum.

Obj. #4: *Assess the availability of specialty care for individuals with diabetes in SD and identify geographically underserved areas.* Ch. Sieverson, M. Minton, C. Lammers, and advanced undergraduate nursing students) *(State objective # 9.1)*	This objective involved the work of advanced undergraduate nursing students. A dual approach was performed to assess the availability of specialty care for individuals with diabetes: 1) A community based assessment of specialty diabetes care services received by people with diabetes, and 2) Assessment of diabetes specialty care services currently available through health centers across the state. 1) *Community based assessment:* - Investigators requested and received Institutional Review Board approval from SDSU, and Aberdeen area IHS to work with human subjects in this project. Additionally, participants who agreed to participate in the assessment provided informed consent. - Literature review was performed to identify current knowledge and guidelines about specialty diabetes care services. - Instrument for data collection: based on the information from the literature review, and evidence based knowledge on specialty services people with diabetes need to receive to assure adequate care, a short survey instrument was developed (See appendix). The instrument includes questions that provide demographic information (age, race, gender, geographic area of residency), participants' diabetes status, and the diabetes care services they received (type of diabetes, use of medication, who provides medical care and where, what type of services, where are those services located, how do they pay for the services). (Appendix #5)The instrument was reviewed by faculty members at SDSU Brookings and Rapid City, and was pilot tested with different groups of people with diabetes (including American Indian and Caucasian groups). Changes were made to improve validity/ reliability, to make it easier to use in interviews, and to be able to use it as a self reported survey as well. - Target communities were identified including small rural communities, underserved communities, small town communities, medium size towns, urban

areas, communities with a large number of minority groups, such as American Indians and elderly populations from Caucasian origin. Opportunities for face to face interviewing with people with diabetes in these communities were identified and interviews were conducted by the students, focusing on assessing how people with diabetes perceived the availability of the health care services they needed to take care of their diabetes, and what diabetes health care services they actually received. (Sites included: primarily eastern and north eastern SD, senior groups in Watertown, Dakota Magic gathering for seniors in north Sisseton, central and western SD areas such as Lower Brule area).

- Data analysis: frequency and descriptive statistical analysis was performed to summarize and report results. JMP, SAS software.

2) *<u>Assessment of health centers about diabetes care services and how they provide diabetes specialty care services to the people with diabetes:</u>*
   - Health clinics, centers, and organizations that provide diabetes care across the state were identified: Avera McKennan, Sanford Health, Indian Health Services clinics, Community Health Care Centers, support groups, diabetes educators, and hospitals. Agencies were contacted, and a contact person was identified. Each contact person was interviewed by phone or received an e-mail and was asked to answer 4 questions about the specialty diabetes health care services provided to people with diabetes, who are the health professionals who provide these services, and type of referrals made at the clinic when services are not available.
   - Instrument use: A questionnaire with 4 short questions was developed to collect the information we needed from all sites. The same short questionnaire was offered via e-mail to make sure the contact person had enough time to gather the relevant

	information describing the location of their clinics, the scope of diabetes care services offered, the professionals who delivered the services, the availability of the services in terms of hours per week, month, need for referrals and how they were handled. (Appendix #6)
Objective #5: Establish a central depository of information, to be housed on the Diabetes Prevention and Control Program's website, about diabetes-related research being undertaken in SD. (T. Stenvig, M. Kemnitz, M. Fisher, C. Lammers) *(State objective # 10.1*	A literature search of electronic data bases at Briggs Library and Wegner Health Science Information Center was performed, and USD – Sanford Health School of Medicine web site was utilized to find current researchers working in diabetes related topics: a. We identified researchers in the state and contacted them to ask about their research. The information included type and topic of the research, principle investigators/other authors, date of research/publication if published or if it is ongoing. b. Data was compiled in a table to be published at DPCP website. This is an ongoing process, as new research is being developed.
Objective #6: Establish a list of collaborative partnerships for diabetes research across the state, to include researchers, communities, organizations, and funding sources. The final product will be housed on the Diabetes Prevention and Control Program's website. (C. Lammers) *(State objective # 10.2)*	A multi-step strategy was used to identify collaborative partners for diabetes research across the state: a. The first step was to perform an on-line, web based search of data bases (key words: Diabetes Care – Research- South Dakota). General web searching tools, Med Web, and Med Escape, were used to identify collaborative partners. The second step included contacting key people involved in clinical care and research at different sites and institutions. The third step was to find direct contact information for each partner. b. The information was organized in tabular format by the name and type of the organization, contact information, and category of the organization (Health, Research, Education, or Funding institutions or agencies).

Results

This section includes a description of the findings and results for each individual objective. Individual figures and tables for each objective are included in this section.

Target Objective

Objective #1: Revise the SD Diabetes Information Link Program enrollment card to distinguish enrollees by age, type of diabetes, and ethnicity. *(State objective #3.7.)*

The following changes were introduced to the original enrollment card:

a. Changes to the format included a larger link card size that allows for additional space to add more data.

b. Printing specifications for the revised card were provided. The new card has three sections and a self adhesive band at the bottom that the participant will fold before mailing to the DPCP.

c. The revised card (figure 1) includes additional participant demographic data, such as age, race, ethnicity, gender, and educational level; and relevant information about type of diabetes, time at diagnosis, and diabetes status.

d. Consent paragraph included more specific information regarding current agreement to participate in the link card program and further participation in specific evaluations and other types of surveys, including a state wide program evaluation survey. The terms anonymous and confidential appear in the text.

e. The format and information in the card comply with HIPPA regulations.

f. Once the final new version is printed, it will replace the old link card.

Figure 1:

DIABETES INFORMATION LINK

South Dakota Diabetes Prevention Control Program

615 E. 4th Street

Pierre, SD 57501

1-800-738-2301

http://diabetes.sd.gov

Funded by a grant from the Centers for Disease Control and Prevention the Diabetes Information Link is a free resource provided to all persons with diabetes in South Dakota. The link offers materials about diabetes including healthy eating, being active, problem solving, health coping, reducing risks, resources and much more. To receive this information, please fill out the form below and place it in the mail. The SD Diabetes Prevention Control Program will send you information on a regular basis. If you have suggestions for the link, please contact staff at the number above.

Diabetes Information Link
SD Department of Health

Diabetes Prevention Control Program

Name (First, Middle, Last) Birth date

Mailing Address Gender

City State Zip

Date of Diagnosis

Please Check One: ___ White/Hispanic of Latino ___White/non-Hispanic or Latino ___ American Indian ___Asian ___African American ___Other

Have you participated in an educational session related to managing your diabetes? Yes No

If yes, where and please explain: _____

Would you be interested in participating in any future brief written surveys regarding diabetes and its complications? Yes No

The information obtained from this survey will be used to assess the needs of persons with diabetes in SD which will help us in providing the best, most appropriate care to all people with diabetes.

THANK YOU

Target Objective

Objective #2: Identify barriers to diabetes care and develop strategies to eliminate or lessen these barriers. *(State objective #7.2)*

The state of South Dakota, with a population of 775,933, consists mainly of rural communities. Of South Dakota's population, over half live in communities with 5,000 people or less. A calculated 88% of the population is predominantly Caucasian with Native Americans being the largest minority consisting of 8.4% of the population. Older adults over 65 years, make up 14.2% of South Dakota's population, which is higher than the average in the United States. The poverty level in South Dakota is 12.4%, and South Dakota's American Indian reservations house 4 out of the 5 lowest incomes per capita in the United States. (US Census Bureau)

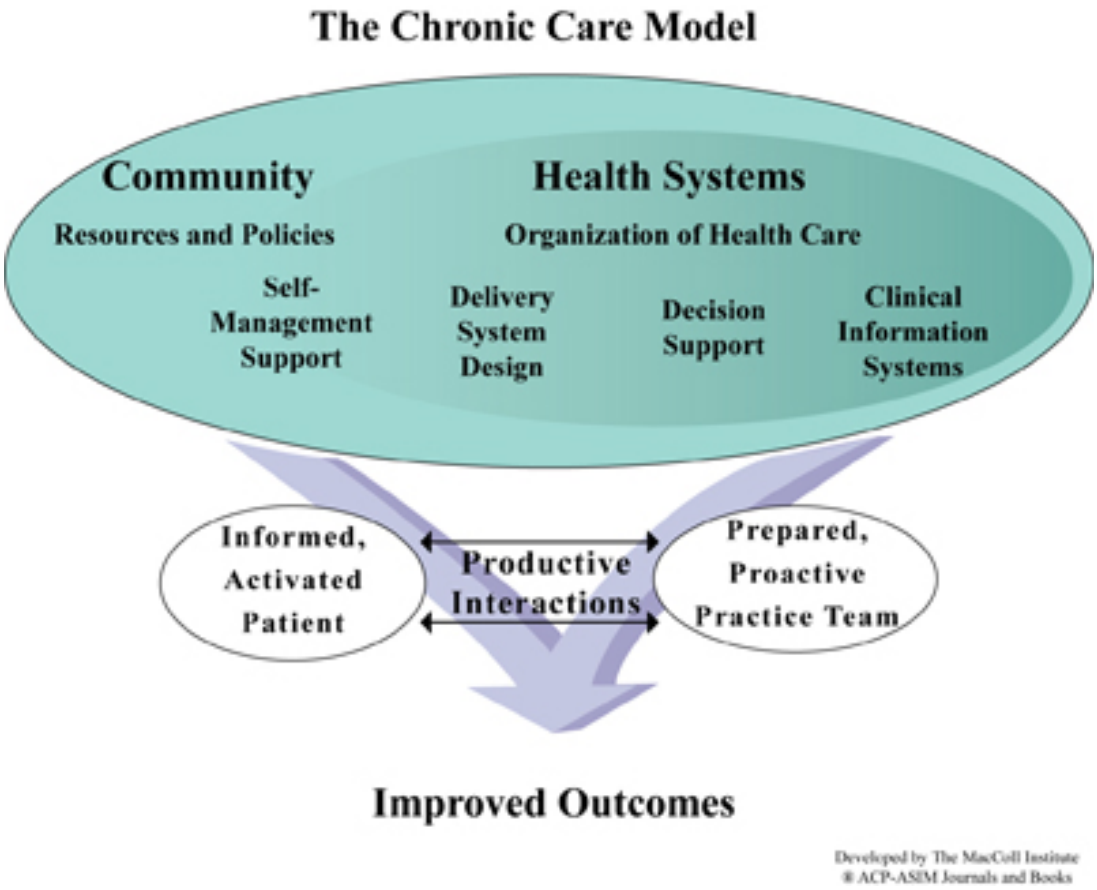
Barrier identification is critical in minimizing adverse effects associated with diabetes. Earlier studies have indicated that diabetic self-care behavior is influenced by social, environmental, work schedule, group activities and other self identified factors (Barchard, 1993). According to Zgiebor and Songer (2001) the main barriers to diabetes health care include socioeconomic status, physical access and transportation to the care facility, and lack of specialty care. Nagelkerk, Reick, and Meengs (2005) identified several barriers to successful self-management of diabetes: lack of knowledge of a specific diet plan, lack of understanding of the plan of care, helplessness and frustration form lack of glycemic control, continued disease progression despite adherence, lack of individualized an coordinated care, limited resources to obtain recommended diabetic essential care, inconvenient group diabetes education sessions, difficulty in remembering to take medications, and lack of knowledge about medications. In addition to those listed above, Goolsby (2007) reports poor compliance as a major barrier.

Many strategies have been implemented in order to address the growing concern for these barriers. Self-management programs have been established, but patient adherence to these programs are hindered not only by barriers previously mentioned, but also by the patient's lifestyle and confidence in their ability to manage their condition. Even though there is an opportunity to reduce the conditions associated with diabetes, there is little reported on the barriers associated with diabetes care and management in the State of South Dakota. The results of this study describe some of the barriers to diabetes care in South Dakota, and discuss strategies to reduce these barriers.

As described in the methods section, the theoretical framework for the assessment portion of this project was The Chronic Care Model (CCM) because it promotes high-quality chronic disease care. This model consists of six elements: Community, the health system, self-management support, delivery system design, decision support, and clinical information systems. The six elements all have an important function in the Chronic Care Model. The community element provides patients with resources and support in his or her surrounding environment. The health system involves the entire organization having the ability to be adaptable and creative in making policies that support chronic disease management.

Self-management support is empowering individuals to take an active role in their own care. The delivery system design focuses on proactive care and prevention. Decision support entails making decisions based upon research and patient's needs. Finally clinical information systems involve having patient and population data readily available in order to provide efficient care. Each element contains evidence-based modifications. This model also encourages positive communication between providers and patients. As stated earlier, successful self-management is crucial to achieve glycemic control and prevent complications, and successful self-management requires community and system support. The three goals of the CCM are to improve the health of the people with diabetes, to increase providers' satisfaction, and to reduce the costs of treating diabetes and its complications. (The Chronic Care Model, 2007).

Figure 2. The Chronic Care Model, (CCM, 2007)



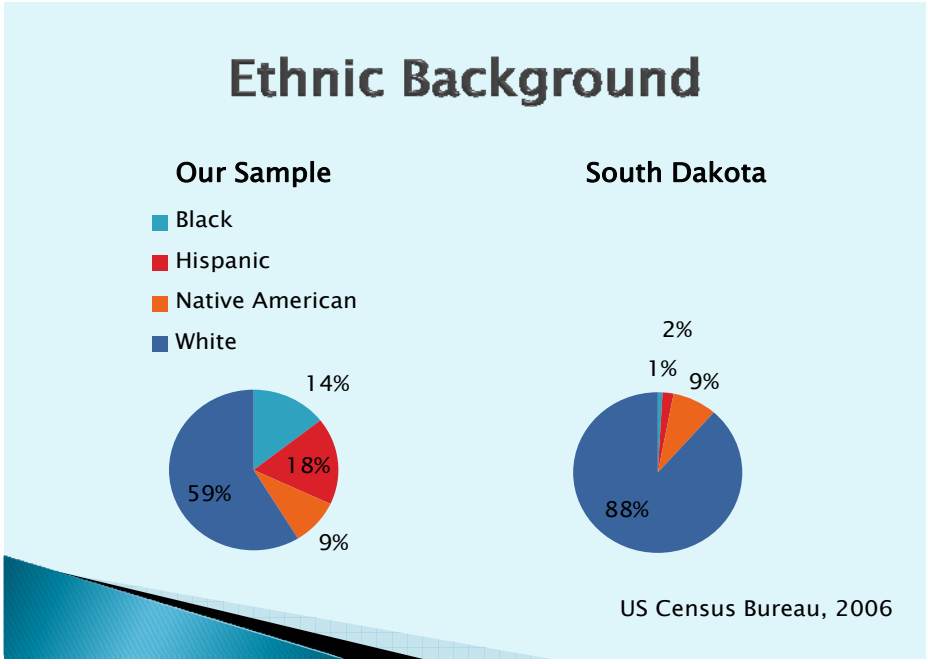
One group of nursing students and the co-investigator of this study, interviewed people with diabetes type 2 at a rural clinic in Lincoln County, an urban diabetes clinic in Minnehaha County. (Table 1) Additionally, two local endocrinologists, one diabetes care nurse coordinator, and a nurse administrator were interviewed using the survey instrument developed. (Appendix #2)

Table 1: Results of interviews conducted with people with diabetes type 2. (CCM instrument) (N=15)	
Age	67.8
Gender	5 female/10 male
Ethnic background	12 Caucasian/3 Native Americans
Education	4 four-year college/3 high school/8 technical school
Living conditions	7 home with family/6 home alone/1 retirement facility/1 other
Insurance	3 Medicare/1 Medicaid/4 private/7 Medicare plus a supplement
Provider	11 physician/2 physician assistant/2 not stated
Assessment of care for chronic conditions according to the Chronic Care survey	3.9
Primary Care Provider score	3

Identified barriers among people with diabetes were: inadequate transportation resources, unfavorable weather conditions, lack of financial resources. According to health providers' interviews, barriers to diabetes care were: lack of insurance, management compliance issues, and lack of awareness of complications. According to a local diabetes educator, the major barriers to diabetes care are lack of education about diabetes management and transportation. A nursing administrator identified lack of collaboration and communication among health care providers as a primary issue regarding diabetes care. Further analysis of the data obtained based on the Chronic Care Model showed a deficiency in the self-management element related to lack of education on food portion and control, and a deficiency in the community elements (health system needs) related to the need for community awareness related to diabetes resources.

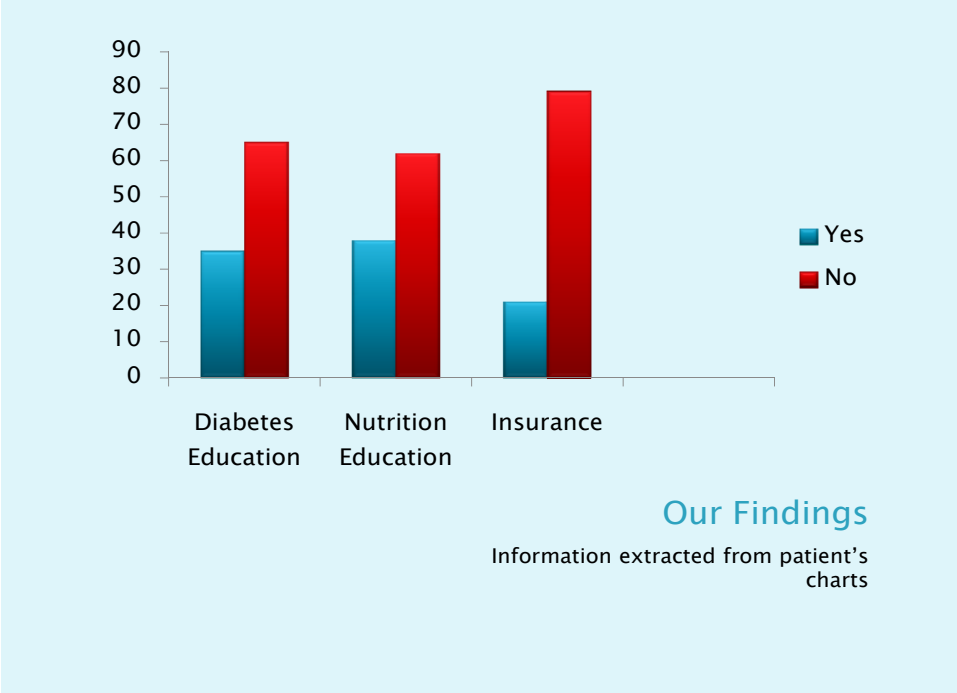
A second group of nursing students interviewed people with diabetes at an urban clinic in Brookings County, and one in Minnehaha County that provides care to underserved populations. Thirty eight eligible patients (meeting criteria of HbA1c of equal to 7 or greater who had not been seen in the clinic for one year) were contacted, and eight were reached and interviewed.

Figure 3: Ethnic composition of study participants from urban Sioux Falls clinic compared to SD population.



Interviews results showed that 75% of patients believed they needed to work on improving their self-management of diabetes. We found lack of education about diabetes to be one of the major barriers, and more specifically the lack of education that is provided at appropriate literacy levels that addresses all cultures. According to our statistics only 37% percent of participants received nutrition education by a licensed dietitian and 37% percent received diabetes education by a diabetes educator (Figure 4). Another identified barrier was the lack of insurance which limited patient's ability to receive care and resources to self-manage their diabetes. This also leads to inadequate referrals to specialists because individuals cannot afford their services. Another major barrier we found was the lack of transportation in the community due to inability to afford public transportation or their own means of transportation.

Figure 4: Results from chart review regarding diabetes education and insurance in underserved population



A separate assessment of people with diabetes type 2 was performed by the graduate student working with the project and the co-investigator. An electronic and/or hard copy questionnaire containing 39 questions was given to 60 individuals living with diabetes. This instrument was also based on the Chronic Care Model. The survey questions were divided into four main categories: (i) demographic information; (ii) the type of help the patient receives from their health care team; (iii) an understanding of the diabetes condition; (iv) how perceived barriers affect diabetes care. All residents of South Dakota living with diabetes were eligible to participate in the study. Sixty participants (12% response) agreed to complete the 39 question inventory about diabetes barriers to care. Of the study participants, 48.3% of them lived in the Wessington Springs community; 13.3% were from Sioux Falls, 10.0% were from Huron and the remaining were in smaller communities located throughout the state (Table 2). The average age for the participants was 66.47 years (range 38 – 95 years); 61.7% were female and 38.3% were male. The ethnicity was majority Caucasian (Table 3). Within the study participants, 86.7% of them lived at home, 1.7% lived in an assisted living center, and 10.0% had other living arrangements. The majority of our participants had some high school or high school diploma (41.7). Of the 60 participants, 10.0% had no insurance coverage and 31.7% utilized a private insurance company. There were 3.3% of the participants on Medicaid and 16.7% with Medicare.

Table 2. People with diabetes type 2 in central, south, and south eastern		
South Dakota Community	**Percent (%)**	**N**
Fort Pierre	3.3	2
Gregory	3.3	2
Huron	10.0	6
Lake Andes	5.0	3
Phillip	1.7	1
Sioux Falls	13.3	8
Wessington Springs	48.3	29
White Lake	3.3	2

Table 3. Participants by race/ethnicity and education	
Ethnicity	**Percent (%)**
Caucasian	78.3
Native American	11.7
Asian	1.7
Other	3.3
Education Level	**Percent (%)**
8th Grade or less	3.3
Some High School / High School	41.7
Technical / Some College	30.0

The participants in this study were all living with diabetes. In addition to diabetes, 26.7% were living with heart disease, 6.7% with cancer, 1.7% with musculoskeletal disease, and 66.7% with other conditions.

The type of help received by health care team: The participants in this study were asked 20 questions regarding the type of help they received from their healthcare team. Of the participants, 53.3% said that when meeting with their healthcare team they were not encouraged to go to a specific group or class to help them cope with their chronic condition. Only 13.3% of participants were asked to talk about their goals in caring for their condition. In addition, 15% of the participants were contacted after a visit to see how things were going.

Understanding of Diabetes related issues: When asked to rank their understanding of diabetes related issues 23.3% of the participants felt that they had a poor understanding of how to manage their diet for blood sugar control. (*Table 4*) Analysis also indicated that 23.3% of participants had a poor understanding of "prevention and treatment of low blood sugar, and 20.0% had a poor understanding of "prevention and treatment of high blood sugar". However, 63.3% of participants had a good understanding of their overall diabetes care.

Table 4: Understanding of Diabetes Related Issues

Issue	Poor (%)	Good (%)	Excellent (%)
Overall diabetes care	13.3	63.3	21.7
Diet for blood sugar control	23.3	51.7	23.3
Role of exercise in diabetes care	20.0	48.3	28.3
Medication you are taking	8.3	50.0	31.7
How to use the results of blood sugar monitoring	11.7	63.3	21.7
How diet, exercise, and medications affect blood sugar levels	8.3	65.0	25.0
Prevention and treatment of high blood sugar	20.0	53.3	23.3
Prevention and treatment of low blood sugar	23.3	46.7	21.7
Prevention of long-term complications of diabetes	20.0	53.3	23.3
My family and friends are supportive of my chronic condition	15.0	55.0	28.3

Situations Affecting Diabetes Care: Perceived barriers and their effects on diabetes care are listed in Table 5. Some participants indicated that "Affordability" was affecting their diabetes care "sometimes" *(20.0%*) and other indicated that it affected them "often" *(20.0%)*. Participants also indicated that "physical health" was "sometimes" *(41.7%)* affecting their care and another 16.7% indicated that it "often" affected their diabetes care. Analysis indicated that the "lack of an exercise facility" was an important factor that influenced their physical activity.

Table 5: How often do these situations affect your diabetes care

Situation	Rarely (%)	Sometime (%)	Often (%)
Traveling distance to healthcare facility	63.3	23.3	10.0
Lack of educational opportunities	55.0	31.7	6.7
Lack of one-on-one time with treating physician	63.3	26.7	5.0
Lack of family support	66.7	18.3	10.0
Affordability	53.3	20.0	20.0
Insurance Coverage	50.0	20.0	21.7
Medication and supply cost	43.3	20.0	28.3
Lack of exercise facilities	53.3	23.3	18.3
Work related activities	60.0	25.0	8.3
Personal feelings toward my chronic condition	41.7	41.7	6.7
Physical health	36.7	41.7	16.7
Your understanding of the chronic condition	41.7	36.7	13.3

Healthcare Provider: A physician (41.7%) and a physician assistant (36.7%) were the primary care providers for the study participants. (Table 6)

Table 6: Healthcare provider						
Question	**Physician (%)**	**Physician Assistant (%)**	**Nurse Practitioner (%)**	**Private Clinic (%)**	**Community Clinic (%)**	**Do not know (%)**
Who is your healthcare provider?	41.7	36.7	13.3	1.7	-	-

Diet Instruction: When asked if they had been given diet instruction in response to their diabetes condition, 33.3% of the participants were provided instruction by a Registered Dietitian. A Certified Diabetes Educator provided 16.7% of the participants with diet instruction, and 10.0% of the participants were given instruction by other health professionals. However, 18.3% of the participants were not given diet instruction for their diabetes condition. (Table 7)

Table 7: Were you provided diet instruction and by whom?				
Question	**YES, by a Registered Dietician (%)**	**Yes, by a Certified Diabetes Educator (%)**	**Yes, by another health professional (%)**	**No, I was not provided a diet instruction (%)**
Were you provided diet instruction and by whom?	33.3	16.7	10.0	18.3

Diabetic Patients Concerns: Responses to the open-ended question "What is your biggest concern about diabetes?" are listed in Table 8. The majority of the concerns are centered on the long term health effects of diabetes. In addition, affordability, cost and insurance were other frequently mentioned concerns.

Table 8: Participants biggest concern about diabetes.
A1C results and daily blood sugar results.
Always to keep it in check. Don't want it to get out of control.
Being in the know of what foods to eat. I am aware of carbohydrates and sugar content. I exercise almost everyday, I walk 2.5 miles a day, depending on the weather, otherwise I bicycle.
Blindness
Circulation in feet and probably eyes.
Concerned about long time health effects.
Cravings are a big problem and exercise hard to get motivated.
Cuts and soars- surgery that health slowly.
Going blind and losing a limb
How it will affect me in later years.
I have a bad back and unable to exercise or be on my feet for longer than ten or fifteen minutes at a time. I am also very obese even though right now my diabetes is under control.
If you don't have a lot of money doctors don't care.
Keeping blood sugar between 60 -150. Its affect on my health as I get older.
Keeping blood sugar under control and the cost. Food is getting expensive.
Keeping glucose at level to keep my pancreas functioning so I don't have to take insulin.
Kidneys only 40% working.
Long term complications
Long term effects.
Long term health problems.
Losing a limb
Losing eye sight or kidney failure.
My weight.
None
My biggest concern is what may happen physically and mentally to me if problem not controlled. Also, dietitian recommended diet soda and to use sugar substitutes.
None, right now because of background and knowledge of it.

Table 8: Participants biggest concern about diabetes.
Passing out when blood sugar spikes or drops
Probably losing my eye sight.
Sore fingers.
Sweets.
Taking meds along when I travel.
That I do not do enough to keep my blood sugar and pressure under control.
That I will allow it to get out of control.
That it may affect my eyesight and kidneys someday.
The after effects of all the medications.
The cost of test strips and medications.
The long term effects on body systems.
The cost is too much, for meals and I cannot afford insurance.
What I can eat.

Target Objective

Objective #3: Identify existing diabetes curriculum for schools of medicine, nursing, pharmacy, and dietetics in SD, and compare curriculum content to the American Diabetes Association Standards of Care and identify gaps. *(State Objective # 8.2 and 8.2.1.)*

These objectives were worked on together since they both deal with the same group of schools and the same outcome. We assessed the school of medicine, USD nursing, USD Physician Assistant (PA) program and dietetics, SDSU undergraduate and graduate nursing programs, as well as several nursing programs around the state. Diabetes educator training and certification program was not assessed. An interview script (Appendix #4) based on the Standards of Care from the ADA was developed as a guide to ensuring that we included all the recommendations from ADA in the interview with the key informants from the schools. Twelve schools were contacted, with a response rate of 50%. (Table 9)

Table 9: schools contacted and responses received.		
School Name:	**Contact Made-Yes**	**Unable to reach**
USD Sanford School of Medicine	x	
USD Physician Assistant Program	x	
USD School of Nursing		x
National American University		x
Lake Area Technical Institute		x
Presentation College		x
Oglala Lakota College		x
Sinte Gleska University		x
Sisseton Wahpeton Community College	x	
Western Dakota Technical Institute	x	
SDSU Dietetics Program	x	
USD Dietetic Internship Program	x	

The team will continue to collect information from the non-responding schools during the summer of 2008 to gather additional information needed to develop recommendations to improve diabetes education curriculum. Based on the feedback received from the programs willing to participate, a list of components from the Standards of Care (SOC) that were included in the curriculum for each program was developed, as well as a list of potential gaps in the curriculum.

Components of the Standards of Care included in the curriculum of the program:

1. Screening for diabetes, diabetes types and diagnosis was covered by each of the programs we interviewed.
2. Benefits of lifestyle modification for diabetes are covered in the medical, nutrition, nursing and PA programs in detail.
3. Most of the programs discuss GDM in their curriculum, but only basic components such as diagnosis, diagnostic criteria and basic risk factors. One of the nursing programs reported this was covered in depth. Nutrition does not include this component.
4. The PA program includes components of physical activity requirements for people with diabetes. Although most of the programs include a section on physical activity and diabetes, they do not offer specific requirements except for the PA program. Nutrition discusses carbohydrate needs for exercise.
5. For the self-management of blood glucose control and HgbA1c, the PA and MD program include sections on this, some in their field work as well as nursing.

6. The effect of stress, illness and trauma on blood sugar is addressed in the MD, PA and nursing programs, but not necessarily in detail and not as a module by itself.
7. Medical Nutrition Therapy (MNT) is included extensively in the dietetics programs.
8. Diabetes Self Management Education (DSME) is included in the PA program in more detail and also in one of the nursing programs.
9. Pyschosocial aspects of diabetes are covered in some detail in the nursing and PA programs.
10. The programs varied a lot in the inclusion of the referral process to other professionals in diabetes as it really depended on the type of diabetes and the setting. Most programs indicated it was included more in the clinical setting, but not so much in the classroom, so it was difficult to assess. The MD program reported that they encourage MD students to refer diabetics to the CDE for more detailed instruction and management. One of the nursing programs reported their curriculum focuses on team approach to diabetes care.
11. The complications of diabetes are taught extensively in the MD, PA and nursing program. Only the basics of this topic are covered in nutrition.
12. Routine exams for eye, foot and dental issues are covered in the MD, PA and nursing programs.
13. Diabetes across the lifespan is covered well in the nursing programs, but not as much in the other programs.
14. Diabetes care in different settings is discussed in more detail in some of the nursing programs.
15. Third party reimbursement issues are included in the curriculum for many of the nursing programs as well as the PA program. The MD program felt their students will get some information on this during their clerkship, but it is not directly included in the curriculum.
16. Strategies for improving diabetes care are only being included in the nursing program. The MD and PA programs include parts of this as it relates to other settings, but again, it is not directly included in the curriculum.

Potential Gaps in the Diabetes Curriculum based on the SOC or areas for improvement in including in curriculum:

1. Not all of the programs include the risk factors associated with diabetes.
2. Specific recommendations on physical activity requirements including duration and type of activity. This was an area needed by most of the programs.
3. Several of the programs could benefit from more inclusion in the curriculum on the benefits of lifestyle modification for diabetes.
4. The effect of stress, illness and trauma on blood sugar is only touched on in the curriculum for nutrition.
5. DSME was not included in the nutrition programs and very little in the MD and nursing programs.

6. Basic principles of MNT are provided, but not in detail for Nursing, PA and MD programs.
7. The psychosocial aspect of diabetes was limited in the PA, MD and nutrition programs with inclusion through disease diagnosis, but directly discussed in the curriculum.
8. The referral process to other professionals was an area that had a lot of variety as to how it is included in the curriculum at the various schools. This area is discussed as the students work through their clinical and direct patient care; however, it is not specific and quite varied.
9. Diabetes complications are only covered in basic detail in nutrition.
10. The topic of routine exams such as foot care, eye and dental exams is covered minimally, if at all, in the dietetics/nutrition programs.
11. Preconception care for diabetes is not covered in nutrition or in much detail in the MD or nursing programs.
12. Diabetes in different settings (such as schools, corrections etc) is covered only minimally in the nutrition, MD and PA programs and covered to a greater extent by nursing in their fieldwork.
13. Third party reimbursement is not covered in nutrition and only minimally in the MD program except in the clerkship.
14. Strategies for improving diabetes care are not covered in nutrition and only minimally for the PA, MD and nursing programs.

Target Objective

Objective #4: Assess the availability of specialty care for individuals with diabetes in SD and identify geographically underserved areas. *(State Objective # 9.1.)*

We used a dual approach to assess the availability of specialty care for individuals with diabetes:

1) Community based assessment of specialty diabetes care services received by people with diabetes: Target communities were identified including small rural communities, underserved communities, small town communities, medium size towns, urban areas, including communities with a large number of minority groups, such as American Indians and elderly Caucasian population. Opportunities for face to face interviewing with people with diabetes in these communities were identified and interviews were conducted by the students, focusing on assessing how people with diabetes perceived the availability of the health care services they needed to take care of their diabetes, and what diabetes health care services they actually received. The instrument (Appendix) was reviewed for faculty members at SDSU Brookings and Rapid City, and was pilot tested with different groups of people with diabetes (including American Indian and Caucasian groups) as described in the methods section. Nursing students and the project co-investigator administered the survey through face to face interviews. Interviews were conducted during fairs at both Dakota Magic Casino and at Enemy Swim Day School, and at a seniors program at Codington County.

The sample size was 12, with seven females, four males, and one unidentified person surveyed. The average age of participants was 61.6 years, with the age range being from 37 to 82. Two thirds of participants lived in small towns (population less than 2500), with another quarter of the participants living on farms. The remaining participants lived in a town with a population between 2500 and 14,999. Participants were first asked specific questions about their diabetes including how long they had been diagnosed, their blood sugar range, methods of diabetes management, and complications. The average amount of time that the patient had known he or she had diabetes was 12.8 years, with lengths ranging from four years and nine months to 35 years. Eighty three and one-third percent of participants surveyed checked their blood sugar at least once a day. Participants checked their blood sugar an average of one and one-third times a day. Twenty-five percent of participants take insulin daily, while another 83.3 percent of patients take oral medications. One participant took both insulin and oral medication. None of the participants interviewed controlled their diabetes through diet modification alone. However, one-third of all respondents said they always followed their diabetic diet. Fifty percent of patients had complications from their diabetes which included the following: eye problems (33%), heart disease (16.7%), joint problems (16.7%), itching (16.7%), and other complications (8.3%).

Questions about access to healthcare providers and insurance coverage were asked in the second section. (Table 11 and 12) Participants were asked what type of health care provider monitored their diabetes, and they were able to list more than one provider if needed. Seventy-five percent of patients reported having a physician monitor their care, while another third of patients reported being monitored by a hospital or public health nurse. Eight percent of participants were monitored by a nurse practitioner. Forty-one percent of participants had a health care visit five or more times a year, with another forty-one percent having visits four to five times a year. The remaining participants made healthcare visits between two and three times a year. In addition, 58.3 % of participants had seen a diabetic specialist at least once in their lifetime.

Table 11: Provider that monitors diabetes

	Native American	Caucasian
Doctor	75%	83.3%
Nurse (Including PHN)	33.3%	8.3%
Nurse Practitioner (NP)	0%	8.3%
Physician Assistant (PA)	8.3%	33.3%
Other	8.3%	16.7%

Table 12: Health care coverage		
	Native American	**Caucasian**
Indian Health Services (IHS)	66.7%	0%
Medicare	16.7%	33.3%
Medicaid	33.3%	0%
Public Health Office	8.3%	0%
State Insurance	0%	16.7%
Self Pay	0%	50%
Private Insurance	8.3%	41.7%
Veteran's Funds	0%	8.3%
Number of Visits to Healthcare Provider in a Year.		
One	No data	8.3%
Two to Three	16.7%	58.3%
Four to Five	41.7%	25%
Five or more	41.6%	8.3%

The average distances participants had to travel to see their healthcare provider was 22.7 miles, and all participants traveled by automobile. Participants were also asked who provided nutritional information to them, and were able to list more than one. Over half of the participants (58.3%) were taught about their diabetes by a dietitian, one third of participants got nutritional information from a physician, and another third got their information from a nurse. (Table 13)

Table 13: Distance travel to health care		
	Native American	**Caucasian**
Average Distance	**22.7 miles**	26.2 miles
Range	**2-0 miles**	0-60 miles
	2 did not respond	5 did not respond
Provider that shared nutritional information with Participant		
Doctor	33.3%	25%
Nurse	33.3%	16.7%
Nutritionist	25%	25%
Dietician	58.3%	50%
Friend	8.3%	16.7%
Other	8.3% (IHS)	0%
None	8.3%	0%
Follow their prescribed Diabetic Diet	33%	33.3%
Know of someone in South Dakota with Diabetes not receiving care	8.3%	8.3%

In the final sections of the survey, participants were questioned about health-seeking behaviors within the past year. Participants were asked about blood sugar, lipids, hemoglobin A1C (HbA1c), blood pressure, eye exams, dental exams, foot exams, and influenza and pneumonia vaccines. One participant did not respond to the questions about blood sugar, HbA1c, lipids, and blood pressure. Three surveyed chose not to respond to the questions relating to dental and foot exams. All participants surveyed had their blood sugar level and their blood pressure checked within the past year. Ninety percent of participants had their HbA1c level and their lipid levels checked in the past year. One-third of all participants had a dental exam in the last year. Foot examinations were received by 88.9% of patients and 83.3 % received eye examinations. All participants responded that they received an influenza vaccine within the last year. In addition, another 83.3 % had received a pneumonia vaccination during their lifetime. (Table 14)

Table 14: Health - seeking behaviors during the past year		
	Native American	**Caucasian**
Influenza Vaccination	100%	66.7%
Blood Sugar	100%*	100%
Hemoglobin A1C	90.1% *	91.7%
Lipids	90.1% *	75%
Blood Pressure	100% *	91.7%
Foot Exam	88.9%**	75%
Dental Exam	33.3%	41.7% **
Eye Exam	83.3%	91.7%
Pneumonia Vaccination (once lifetime)	83.3%	41.7%
* 1 did not respond ** 3 did not respond		

2) Direct assessment of health centers and agencies about diabetes care services and how they provide diabetes specialty care services to the people with diabetes across the state:

Survey data from September, 2007 to April, 2008 reflect diabetic care services provided by 72 community and private based clinics. This information is shown in a map of SD by county location in Figure 4. Information was obtained from Community Health Clinics, Sanford and Avera McKenna clinics, Hospitals, diabetes educators, and endocrinologists. IHS centers location is also included in the map. South Dakota is included in the Aberdeen Area IHS system. The Aberdeen Area provides health care to approximately 94,000 Indians on reservations located in North Dakota, South Dakota, Nebraska and Iowa, with 13 service units located in SD. Its facilities in SD include five hospitals, six health centers, and one urban health program located in Pierre, the state capital. The Aberdeen Area features a comprehensive health care delivery system, including inpatient and outpatient care, preventive clinics, research, and community-based projects. Table 15 shows data from diabetes care services available to people with diabetes across the state including hospital care, endocrinologists and other health providers such as FNP, PA, Family Practice doctors, diabetes educators, diet and nutrition services, laboratory tests, eye and dental exams, foot care, and support groups. Data show availability and distribution of specialty diabetes care services such as eye exams and foot care, diabetes and nutrition education, and consultation with endocrinologist. Distribution of health centers and services across the state identifies underserved areas in SD.

Figure 4: Map shows diabetes health services in South Dakota by county. Modified by Haifa Samra, Cristina Lammers, and 5th semester undergraduate nursing students (T. Bruggeman, A. Berkland, A. Chesley, T. Christensen, B. Fujan, K. Munro, J. Nielsen, and Cari Uecker), 2007-2008.
C (Community Health Clinics), S (Sanford Hlth.), A (Avera Health System), *Support groups *Critical access hospitals, *Diabetes self-education programs, * Endocrinologists, HIS h hospitals, IHS urban program, IHS c healthcenters.
South Dakota County Selection Map (U.S. Census Bureau, 2007.

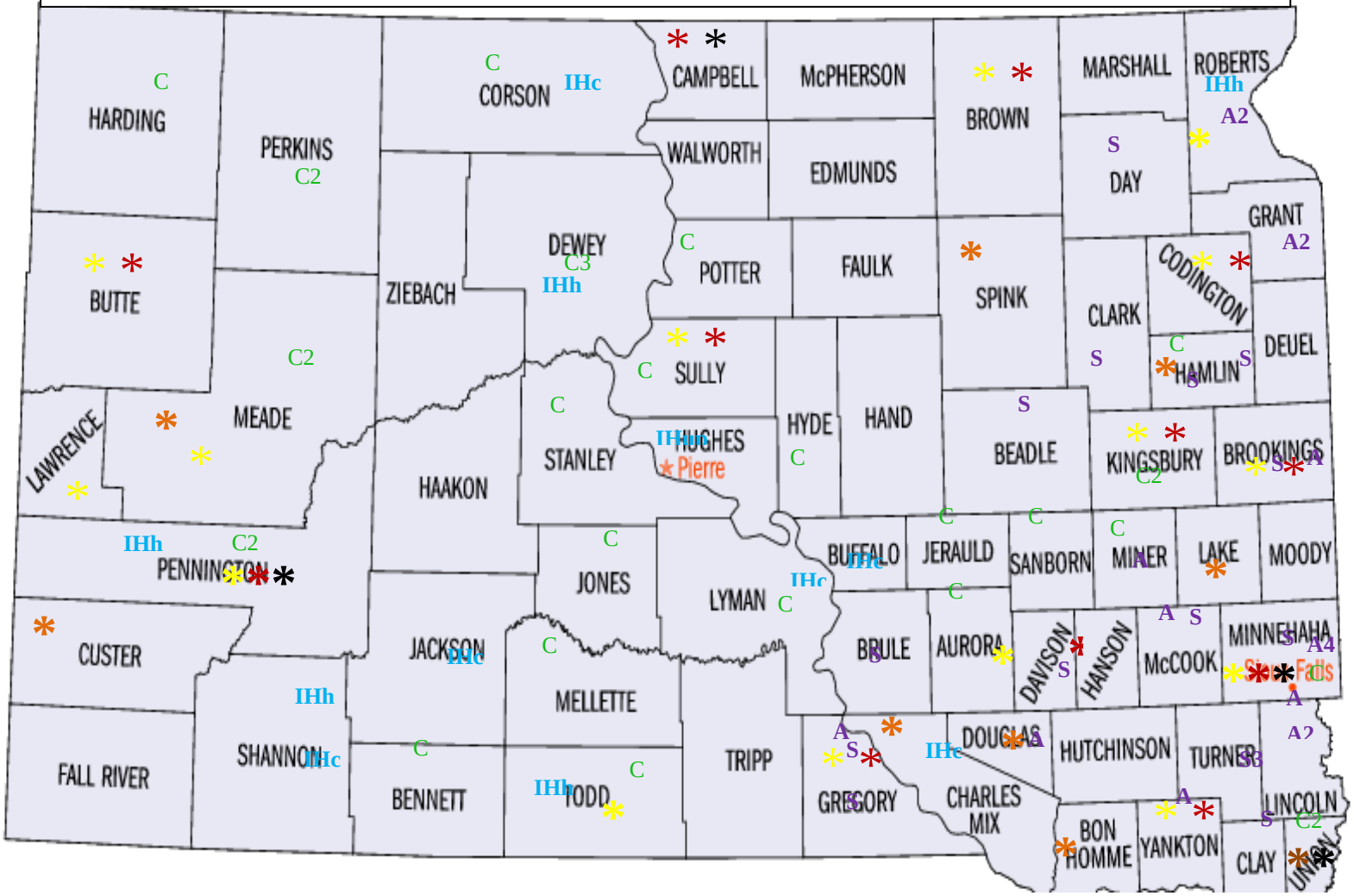


TABLE 15																			
Clinics location		Days/time	Diabetes care services						Providers			Reason Refe	Referrals Made						
Rural/County	Urban/county	M-Fday/ext.	D.Ed	Diet	Denta	Eye Ex	Foot Care	Lab G/L/A1C	Endocr	FNP/PA	MD		D.Ed	Diet	Endocr	eye	foot	Dent	labs
	SWatertown/Codingt	9-5 PM	X	x			X	X		FNP	X	New			X	X		x	
Sclark/Clark		monthly								FNP					x	x	x	x	
Sstelline/Hamlin		monthly								FNP					x	x	x		
SLakeNord/Hamlin		monthly								FNP					x	x	x	x	
	SSF/Minnehaha	8-5PM	X	X		X	X	X	X	X	X	Ref center							
Sviborg/Turner		8-5PM	x	x wk				x		RN	x	new/contr.			x	x		x	
Sparker/Turner		8-5PM	"	"						x	x		x	x	x	x	x	x	
Scenterville/Turn		8-5PM	"	"						x	x		x	x	x	x	x	x	
Scanistota/Mccook		W 8-5pm	outreach clinic																
Smitchell/Daviso		7-7pm	h	h					x		ped		x	x	x	x	x	x	
Svermillion/Clay		7:30-8pmsat	x	x				x		FNPPA	x	new/insulin			x	x	x	x	
Sbrandon/Minneh		8-5pm M 7pm						x		FNP	x	control	x	x	x	x	x	x	
Sbrookings		7:30-5:30p	h	h				x		PA	x		x	x	x	x	x	x	
Sharrisburg/Lincoln		8-7p satm						x		PA	x		x	x	x	x	x	x	
Sburke/Gregory		8-5p satm		mo.				x		FNPPA	x		x		x	x	x	x	
Shartford/Minne	528-3725 Darla																		
Swebster/Day		8-5pm						x		FNP	x	Tele Med	x	x	x	x	x	x	
Scanton/Lincoln	987-4378									FNP	x								
Schamber/Brule		9-5pm	h				x	x		FNPPA	x		x	x	x	x	x	x	
Spierre/Hughes		MWF8.30-5pm/8pmW				x		x		PA	x		x	x	x		x	x	
Shuron/Beadle		8.30-5pm		h							x		x	x	x	x	x		
Sbonesteel/Greg		M1-5pmW9-12am Outreach clinic																	
Sclearlake/Deuel		8-5pm	3xweek	mo.			Rntrained	x			xx	critical access			x		x	x	
	ASF/Minnehaha	8-5PM						X		PA	X	contr.	x	x	x	x	x	x	
Abrandon/Minne		8-5PM						x		PA	X		x	x	x	x	x	x	
Asalem/McCook		8-5 PM					X	x		PA	X		x	x	x	x		x	
Atea/Lincoln		8-5 PM						x		FNP		contr.Kidne	x	x	x	x	x	x	
Aharrisburg/Lincol		8-5 PM						x		FNP			x	x	Medtv	x	x	x	
Agregory/Gregory		8-5PM						x		FNP	X		x	x	x	x	x	x	
Ahoward/Miner		8-5PM						x		PA	wk	new/contr.	x	x	x	x	x	x	
Acorsica/Douglas		8-5PM						x		FNP	X	contr.	X	X	X	X	x	x	

	ASF/Minnehaha	8-5PM	X	X				x	X		XX						X	x	
	ASF/Minnehaha	8-5pm						x			XX		X	X	x		X	x	
ASacredH/Yankton		8-5pm					X					foot ulcers						x	
	ASF/Minnehaha	8-5pm						x		FNP	X	contr.	X	X	x	x	X	x	
	ASFChildrenSpecialty	8-5pm, ER						x	X			ref center	X	X		x	X	x	
Awilmot/Roberts		12hs week	X	X			X	X		FNP					X	X		X	
Awaubay/Robert		4days/week						X		FNP			X	X	x	X	X	X	
ABigStone/Grant		4days/week					X	x		PA			X	X	x	x		x	
Amilbank/Grant		8-5pm	X	X		X	X	x			X								
	ASF/Minnehaha	9-5pm						X		PAFNP	X		X	X	X	X	X	X	
	Abrookings	9-5pm sat.	h	h				x		PAFNP	X				X	X	X	X	
	CRapidCity/Pennig	8-5pm/1 eve			X		X	x		FNPX									
	CRapidCity/P.Homele	8-5pm/1 eve					X	x		FNPX									
	CSF/Minnehaha	8-5pm/1 eve			X		X	x		FNPX									
Clemmon/Perkins		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cmcintosh/Corso		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cbuffalo/Harding		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cbison/Perkins		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cisabel/Dewey		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cfaith/Meade		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Ceaglebute/Dewey		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Chowes/Meade		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Claplant/Dwey		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cgettisburg/Potter		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Conida/Sully		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cft.pierre/Stanley		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cmurdo/Jones		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cwhiteriver/Mellete		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cmartin/Bennet		8-5pm/1 eve			X		X	x		FNPx			X	X	x	x			
Cmission/Todd		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Chighmore/Hyde		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
CwessSpring/Jerauld		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cdesmet/Kingsbury		8-5pm/1 eve			X		X	x		FNPx			X	X	x	x			
Cwoonsock/Sanborn		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	

Cplankinton/Aurora		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Cbryant/Hamlin		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Clakepres/Kingsbury		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Calcester/Union		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Celkpoint/Union		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	
Choward/Miner		8-5pm/1 eve			X		X	x		FNPx			X	X	x	x		x	
Cpresho/Lyman		8-5pm/1 eve					X	x		FNPx			X	X	x	x		x	

Table 16: Clinics and diabetes services by county and SD quadrant region.		
Northwest Region of South Dakota		
County	**Diabetic Services**	**Practitioners**
Harding	1 Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Butte	Critical access hospital; diabetes self education program	
Lawrence	Diabetes self education program	
Meade	Diabetes self education program; critical access hospital; 2 Community health clinics: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Ziebach		
Corson	Community health clinic: Foot, lab. Indian Health Services clinic **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Dewey	3 Community health clinics: Foot, lab. Indian Health Services hospital **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Perkins	2 Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP

Southwest Region of South Dakota		
County	**Diabetic Services**	**Practitioners**
Pennington	Endocrinologist; diabetes self education program, critical access hospital. 2 Community health clinics (CHC): *Rapid City*: dental, foot care, lab; *Homeless Clinic*: foot care, lab. Indian Health Services hospital	MD, FNP
Custer	Diabetes education program.	
Fall River		
Shannon	Indian Health Services hospital and clinic only	
Bennett	Community health clinic: Foot, lab, dental **Referrals: endo, diab.ed, eye, dietician**	FNP
Jackson	Indian Health Services clinic only	
Todd	Critical access hospital; diabetes self-education program Community health clinic: Foot, lab. Indian Health Services hospital. **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Mellette	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Jones	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Stanley	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Haakon		

Northeast Region of South Dakota		
County	**Diabetic Services**	
Campbell	Endocrinologist; critical access hospital	MD, FNP
Walworth		
Potter	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Sully	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Hughes	Sanford clinic: eye, lab, **referrals made for diab.ed, dietician, endo, eye, foot** Indian Health Services urban program	PA; MD
Hyde	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Hand		
Beadle	Sanford clinic: **referrals made for endo, diab.ed, dietician, eye, foot**	MD
Clark	Sanford clinic: open monthly; **referrals made for endo, eye, foot, dental**	FNP
Spink	Diabetes education program	
Brown	Critical access hospital; support group	MD, FNP
Hamlin	Community health clinic: Foot, lab; r**eferrals for endo, diab.ed, dietician, dental, eye** 2 Sanford clinics: open monthly; **referrals for endo, eye, foot, dental**	FNP FNP

Deuel		
Grant	2 Community Health Clinic: One open M-F with diab ed, dietician, eye, foot, and lab; the other open 4 days/week with lab only, **referrals for diab ed, dietician, endo, eye, dental**	FNP; PA
Codington	Sanford clinic; diab ed, dietician, foot, lab; **referrals taken for new dx; referrals made for endo, eye, foot, dental**	FNP; MD
Marshall		
Roberts	2 Community Health Clinic: One clinic open 12 hours/week with diab.ed, dietician, foot, lab; **referrals for endo, eye, dental**; other clinic open 4 days/week, lab only, **referrals made for endo, dietician, diabetes education, eye, lab, foot** Indian Health Services hospital.	FNP
Day	Sanford clinic: Lab; **referrals made for diab ed, dietician, endo, eye, foot, dental. Has telemedicine**	FNP; MD
McPherson		
Edmunds		
Faulk		

Southeast Region of South Dakota		
County	**Diabetic Services** **Practitioners**	
Kingsbury	Community Health Clinic: foot, lab **Referrals made for endo, dietician, diabetes education, eye, lab**	FNP
Brookings	Sanford clinic: Lab, **referrals made for diab ed, dietician, endo, eye, foot, dental**	PA; MD
Miner	Community Health Clinic: Dental, foot care, lab **Referrals: Diabetes ed, dietician, endo, eye, dental**	FNP
Lake	Diabetes education program	
Moody		
Minnehaha	Community health clinic: Foot, lab, dental; 7 Avera: Lab; **referrals for endo, diab.ed, eye, foot, dental, dietician** (one Avera clinic has diab.ed and dietician; one has 2 MD's; one has MD 3 Sanford clinics: (Brandon)lab; **referrals made for diab ed, dietician, eye, endo, foot, dental** (Hartford clinic no data); **Sioux Falls (referral center): diab ed, dietician, eye, foot, lab**	FNP (CHC) PA; FNP; MD FNP; MD Endo, FNP; MD
McCook	Avera clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician** Sanford Clinic: outreach clinic, open W 8-5 pm	PA; MD
Hanson	Critical access hospital	

Davison	Sanford clinic: open M-F 7-7pm; **referrals made for diab ed, dietician, eye, dental, foot, endo**	Endocrinologist, pedatrician
Sanborn	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Jerauld	Community health clinic: foot care, lab, **Referrals made for dietician, diabetes education, eye, foot care, lab**	
Buffalo	Indian Health Services clinic only	
Lyman	Community health clinic: foot care, lab. **Referrals for dietician, diabetes education, eye, foot care, lab.** Indian Health Services clinic	FNP
Brule	Sanford clinic: foot, lab; **referrals made for diab ed, dietician, endo, foot, dental, eye**	FNP; PA; MD
Tripp		
Gregory	2 Sanford clinics (one is an outreach clinic open M 1-5 and W 9-12; the other open 8-5 pm Sat and Mon) dietician monthly; Lab **Referrals: endo, diab.ed, eye, dental, dietician, foot** 1 Avera clinic: Lab; **referrals made for diab ed., dietician, eye, endo, foot, dental**	FNP; PA;MD FNP; MD
Charles Mix	Diabetes education program, Indian Health Services clinic	
Bon Homme	Diabetes education program	
Yankton	Community health clinic: foot care; support group, critical access hospital	Takes referrals for foot ulcers

Clay	Sanford Clinic: open 7:30-8pm Sat; diab.ed, and dietician, lab; referrals made for endo, eye, foot, dental; referrals for new dx, insulin control	FNP; MD; PA
Union	2 community health clinics: foot, lab **Referrals: Diab. Ed, dietician, endo, eye, dental**	FNP
Turner	3 Sanford clinics: diab.ed, dietician, one has a lab, **referrals made for diab ed,, eye, foot, dietician, endo, dental**	RN; MD
Douglas	Community health clinic: lab **Referrals: endo, diab.ed, eye, dental, dietician, foot,** Takes referrals for diabetic control	FNP/MD
Aurora	Community health clinic: Foot, lab **Referrals: endo, diab.ed, eye, dental, dietician**	FNP
Lincoln	2 Avera health clinic: Lab, one has med tv **Referrals: endo, diab.ed, eye, dental, dietician** 2 Sanford: one open 8-7pm Mon & Sat; lab; referrals made for endo, diab.ed, dietician, eye, foot, dental	FNP PA; MD FNP;MD
Hutchinson		

Table 16 shows data according to geographical quadrants for South Dakota:

Northwest region counties (8): Harding, Butte, Perkins, Lawrence, Meade, Ziebach, Dewey, Corson.

- One county has no health clinic, diabetes education program, or support group; one county has only diabetes education program.
- There are 9 community health clinics and one Indian Health Service clinic; one critical access hospital, and one Indian Health Service Hospital in this region.
- All community health clinics refer patients with diabetes for eye exam, diet and nutrition counseling, endocrinologist, dental, and diabetes education to the nearest health center (larger clinic or hospital).
- There are 3 diabetes education programs.

Southwest region counties (11): Pennington, Custer, Fall River, Shannon, Bennett, Todd, Jackson, Haakon, Stanley, Jones, Mellette.

- 2 counties have no health clinic, diabetes education program, or support group.
- 2 counties have only Indian Health Services hospital and/ or clinic.
- There is one endocrinologist, and one critical access hospital; and 2 IHS hospitals in the region.
- There are 6 community health clinics in this region. Community health clinics refer patients with diabetes for eye exam, diet and nutrition counseling, endocrinologist, dental, and diabetes education to the nearest health center (larger clinic or hospital).
- There are 2 diabetes support groups in the region

Northeast region counties (21): Campbell, McPherson, Walworth, Edmunds, Potter, Sully, Faulk, Hughes, Hyde, Spink, Brown, Marshall, Roberts, Day, Grant, Hamlin, Deuel, Codington, Hand, Beadle, Clark.

- 7 counties have no health clinics, diabetes education program, or support group.
- There is one endocrinologist, 4 critical access hospitals, 2 diabetes education programs, and 4 diabetes support groups in this region.
- There are 4 community health clinics. Community health clinics refer patients with diabetes for eye exam, diet and nutrition counseling, endocrinologist, dental, and diabetes education to the nearest health center (larger clinic or hospital).
- There are 10 private (Sanford, Avera) clinics. Most of these clinics refer patients with diabetes to the nearest health center (larger clinic or hospital).

Southeast region counties (26): Lyman, Tripp, Gregory, Charles Mix, Bon Homme, Yankton, Clay, Lincoln, Turner, Hutchinson, Davison, Hanson, Minnehaha, McCook, Moody, Lake, Miner, Sanborn, Aurora, Brule, Buffalo, Jerauld, Union, Kingsbury, Brookings, Douglas.

- 3 counties have no health clinics, diabetes education program, or support group.
- There are 9 community health clinics; 22 private (Sanford, Avera) clinics; 7 critical access hospitals, 2 IHS clinics, and 2 endocrinologists in this region. There are 5 diabetes education programs, and 6 support groups.

- All community health clinics and most private clinics except for the ones in Minnehaha (Sioux Falls) and Brookings county, refer patients with diabetes for eye exam, diet and nutrition counseling, endocrinologist, dental, and diabetes education to the nearest health center (larger clinic or hospital).

Target Objective

Objective #5: Establish a central depository of information, to be housed on the Diabetes Prevention and Control Program's website, about diabetes-related research being undertaken in SD. *(State objective # 10.1)*

The data was organized in tabular format. Table 17 provides a list of previously published, and current, on-going diabetes research being done in SD.

Table 17: Diabetes research in South Dakota

Author's Name	Facility	Co-Author	Research Title	Year Published
1. WilliamS Harris	USD Medical School	KJ Reid, SA Sands	Blood omega-3 and trans fatty acids in middle-aged acute coronary syndrome patients	Jan-07
2. Jane R Mort	SDSU Pharmacy	JC Delafuente, PS Odegard	Geriatric content in pharmacotherapy and therapeutics textbooks	Dec-06
3. SF Hutton	SDSU Clinical Pharmacy		Byetta (exenatide): what's your gut feeling?	Jan-06
4. Nancy L Fahrenwald	SDSU Nursing	W Stabnow	Sociocultural perspective on organ and tissue donation among	Nov-05

			reservation-dwelling American Indian adults	
5. LG Best	Missouri Breaks Industries Research Inc.	Y Zhang, ET Lee, JL Yeh, L Cowan, V Palmieri, M Roman, RB Devereux, RR Fabsitz, RP Tracy, D Robbins, M Davidson, A Ahmed, BV Howard	C-reactive protein as a predictor of cardiovascular risk in a population with a high prevalence of diabetes: the Strong Heart Study	Aug-05
6. M Sonee	SDSU Pharmacy	T Sum, C Wang, SK Mukherjee	The soy isoflavone, genistein, protects human cortical neuronal cells from oxidative stress	Sep-04
7. M Natarajan	USD School of Medicine	C Larson, ET Zawada Jr	Ischemic nephropathy in South Dakota: case reports and review	Sep-04
8. MC Morris	Avera McKennan Transplant Institute	RN Santella, ML Aaronson, RM Jindal	Pancreas Transplantation	Jul-04

9. LG Best	Missouri Breaks Industries Research Inc.	M Davidson, KE North, JW MacCluer, Y Zhang, ET Lee, BV Howard, S DeCroo, RE Ferrell	Prospective analysis of mannose-binding lectin genotypes and coronary artery disease in American Indians: the Strong Heart Study	Feb-04
10. CD Brown	Sioux San HIS Hospital Eye Clinic		A comparative study of panretinal photocoagulation and vitrectomy for advanced diabetic retinopathy	Jul-03
11. AM Ahmed	University of Bahr Elghazal Medical		History of diabetes mellitus	Apr-02
12. TK Welty	Aberdeen Area Tribal Chairmen's Health Board	DA Rhoades, F Yeh, ET Lee, LD Cowan, RR Fabsitz, DC Robbins, RB Devereux, JA Henderson, BV Howard	Changes in cardiovascular disease risk factors among American Indians; The Strong Heart Study	Feb-05
13. J Li	SDSU Pharmacy	K Kamath, C Dwiveti	Gellan film as an implant for insulin delivery	Apr-01

14. AD Hilton	28th Aeromedical Dental Squadron, Ellsworth AFB	TA Hursh	Type 2 diabetes in an aviator, protein diet vs. traditional diet: case report	Mar-01
15. AM Ahmed	University of Bahr Elghazal Medical	A Hussein, NH Ahmed	Diabetic autonomic neuropathy	Nov-00
16. J Giroux	Epidemiology Program, Aberdeen Indian Health Service Area	TK Welty, FK Oliver, JS Kaur, G Leonardson, H Cobb	Low national breast and cervical cancer-screening rates in American Indian and Alaska Native women with diabetes	Nov/Dec-00
17. X Guan	SDSU Pharmacy	MR Davis, C Tang, CM Jochheim, L Jin, TA Baillie	Identification of S-(n-butylcarbamoyl)glutathione, a reactive carbamoylating metabolite of tolbutamide in the rat, and evaluation of its inhibitory effects on glutathione reductase in vitro	Dec-99
18. KA Stone	Rapid City Regional Hospital Family Practice Residency		Lithium-induced nephrogenic diabetes insipidus	Jan/Feb-99

	Program			
19. K Korn	Student Health Services USD		Diabetes mellitus information on the Internet	Feb-98
20. PJ Singh	USD School of Medicine, Dept of Internal Medicine	RN Santella, ET Zawada	Gastrointestinal prokinetic agents for enhancing drug response in gastroparesis	Nov-97
21. ST Guse	USD School of Medicine	FG Alvine	Treatment of diabetic foot ulcers and Charcot neuroarthropathy using the patellar tendon-bearing brace	Oct-97
22. S Mahmoodian	Epidemiology Program, Aberdeen Area Indian Health Service		Cervical and breast cancer screening rates in Sioux Indian women	Mar-97
23. TK Welty	Epidemiology Program, Aberdeen Area Indian Health Service	DA Rhoades, F Yeh, ET Lee, LD Cowan, RR Fabsitz, DC Robbins, RB Devereux, JA Henderson, BV Howard	Cardiovascular disease risk factors among American Indians. The Strong Heart Study	Aug-95

24. MS Hein	USD School of Medicine, Physiology & Pharmacology	EH Schlenker, KP Patel	Altered control of ventilation in streptozotocin-induced diabetic rats	Nov-94
25. TK Welty	Epidemiology Program, Aberdeen Area Indian Health Service	N Zephier, K Schweigman, B Blake, G Leonardson	Cancer risk factors in three Sioux tribes. Use of the Indian-specific health risk appraisal for data collection and analysis	Oct/Dec-93
26. TK Welty	Aberdeen Area Indian Health Services	JL Coulehan	Cardiovascular disease among American Indians and Alaska Natives	Jan-93
27. RM Stahn	Department of Epidemiology, Aberdeen Area Indian Health Service	D Gohdes, SE Valway	Diabetes and its complications among selected tribes in North Dakota, South Dakota, and Nebraska	Jan-93
28. MB Patel	USD School of Medicine, Physiology & Pharmacology	PL Zhang, AC Patel, KP Patel	Altered pressure-volume relation of right atrium and venoatrial junction in diabetic rats	Oct-92
29. J Schwerin	Avera McKennan Hospital		A witness of the human spirit	Jun-92

30. PL Zhang	USD School of Medicine, Physiology & Pharmacology	MB Patel, KP Patel	Renal responses to acute volume expansion and atrial natriuretic factor in streptozotocin-induced diabetic rats	Oct-91
31. DW Zeigler	USD School of Medicine, Physiology & Pharmacology	KP Patel	Reduced renal responses to an acute saline load in obese Zucker rats	Sep-91
32. TK Welty	Epidemiology Program, Aberdeen Area Indian Health Service		Health implications of obesity in American Indians and Alaska Natives	Jun-91
33. PL Zhang	USD School of Medicine, Physiology & Pharmacology	KP Patel	Blunted diuretic and natriuretic responses to central administration of clonidine in streptozocin-induced diabetic rats	Mar-91
34. CW Mohler	South Dakota Academy of Ophthalmology	RE Smith, A Patz	Diabetes 2000. Elimination of preventable blindness from diabetes by the year 2001	Dec-90
35. R Barth	Central Plains Clinic, Sioux	D Darger, G Haas, S McCollar, ML	Teaming up for diabetes education	Nov-90

	Falls	Oyos, A Sparling		
36. KP Patel	USD School of Medicine, Physiology & Pharmacology	PL Zhang	Attenuated renal responses to atrial natriuretic factor in streptozotocin-induced diabetic rats	Mar-90
37. ML Davies	USD School of Medicine	DL Elson, D Hertz, JM McMillin	Syndrome of plasma cell dyscrasia, polyneuropathy, and diabetes mellitus	Mar-90
38. ET Zawata Jr	USD School of Internal Medicine		Metabolic considerations in the approach to diabetic hypertensive patients	Dec-89
39. KP Patel	USD School of Medicine, Physiology & Pharmacology	PL Zhang	Reduced renal responses to volume expansion in streptozotocin-induced diabetic rats	Sep-89
40. WilliamS Harris	USD Medical School	KJ Reid, SA Sands	Blood omega-3 and trans fatty acids in middle-aged acute coronary syndrome patients	Jan-07
41. Jane R	SDSU	JC Delafuente,	Geriatric content in pharmacotherapy and	Dec-06

Mort	Pharmacy	PS Odegard	therapeutics textbooks	
42. Kendra Kattelmann, PhD, RD, LN	Didactic Program in Dietetics / South Dakota State University		Use of the traditional Northern Plains Indian's Diet and control of Type 2 Diabetes. (Ongoing research)	

Target Objective

Objective #6: Establish a list of collaborative partnerships for diabetes research across the state, to include researchers, community organizations, and funding sources. The final product will be housed at the DPCP web-site. *(State objective # 10.2)*

The information was organized in tabular format by the name and type of the organization, contact information, and category of the organization (Health, Research, Education, or Funding institutions or agencies). (Table 18)

Table 18: Updated preliminary list of collaborative potential partners with the SDDOH		
Name	**Type of organization/Resource**	**Contact information**
Education - Health and Research - Institutions and Organizations		
SDSU College of Nursing- Research Coordination	Research, services, dissemination, training.	Nancy Fahrenwald P.O Box 2275 Brookings, SD 57006 SNF # 210 605-688-4098 Fax: (605)6886119 Email: nancy.fahrenwald@sdstate.edu
SDSU Nutrition and Dietetics	Nutrition , Food and Science and Hospitality SNF # 0443	Kendra Kattelmann 605- 688-4045
SDSU Health promotion	Health, Physical Education and Recreation Center	Coordinator: Andrew Creer Ph.D PEC 119

	Health Promotion Coordinator	Phone: (605)688-4034 Andrew.creer@sdstate.edu
SDSU Pharmacy	College of Pharmacy	Donna Keeler; Jane Mort SPH 125 605-688-6197
South Dakota Academy of Physician Assistants	Research, services, dissemination, training.	Mary B. Nafus, Executive Secretary 120 S. Madison Avenue Pierre, SD 57501 605-224-1203 605-224-8224 fax email
Sanford Health	Health Care system: 330 physicians, 150 health care facilities. Services and Research.	1350 West 18th St PO Box 5039 Sioux Falls, SD 57117-5039
DIABETES CARE CENTER **Sanford Health**	Diabetes self management and self care education. Research.	http://sanfordhealth.org/Services/DiabetesCareCenter
USD – Physician Assistant Program	USD- PA Study Program. School of Health Sciences. Services and Research.	414 E. Clark Julian 205

		Vermillion, SD 57069 605-677-5128
South Dakota Health Research Foundation	Research group (USD School of Medicine) Clinical Research Services	Sanford Research/USD 1100 E 21st St Suite 700 Sioux Falls, SD 57105 Phone: (605)328-1300 Attn: Joe Glasford
University of South Dakota School of Medicine	Cardiovascular Research Institute	CRI 1100 East 21st St 7 floor SF, SD 57105 605-328-1300
University of South Dakota School of Medicine	Training and research.	414 E. Clark Lee Medical Building Vermillion, SD 57069 Phone: (605)677-5233 Email: usdsmsa@usd.edu

Avera McKennan Diabetes Center	Health care services, diabetes education, self care and self management. Diabetes support groups.	800 E 21st St P.O.Box 5045 Sioux Falls, SD 57117 Phone: (605)322-8995 Website: http://www.averamckennan.org/amck/services/diabetes/diabetes.aspx
Avera McKennan Endocrinology **Avera health**	Specialty care and Research.	800 E 21st St P.O.Box 5045 Sioux Falls, SD 57117 Phone: (605)322-8995
Avera Research Institute	Clinical research.	David Kuper, Executive Director 2020 S. Norton Ave. Sioux Falls, SD 57105 605-322-3085 Vicki Munson: 605-322-3087 Mary Hurd: 605-322-3064

Mt. Rushmore Chapter of Diabetes Educators	Training and dissemination.	AADE SD Chapter
AADE (American Association Diabetes Educators)	Training, dissemination and research	200 W Madison Suite 800 Chicago, IL 60606 Phone: (800)338-3633 Email: aade@aadenet.org
SDNA (SD Nursing Association)	Training, dissemination, research	Executive Director: Brittany Novotny P.O.Box 1015 Pierre, SD 57501 Phone: (605)945-4265 Fax: (605)945-4266 Email: sdnurse@midco.net
SDSU - Extension Services	Expanded Nutrition- SNF # 425 Family and Consumer Sciences SNF # 239	Nutrition Coordinator Suzanne Stluka SNF 435 605-688-4038

Tribal Colleges in South Dakota	OGLALA LAKOTA COLLEGE	Oglala Lakota College Thomas Shortbull, President 490 Piya Wiconi Road - PO Box 490 Kyle, South Dakota 57752 605-455-6000 Fax 605-455-2787
	SINTE GLESKA UNIVERSITY	Sinte Gleska University Dr. Lionel Bordeaux, President 205 Main Street Mission, South Dakota 57555 605-856-5880 Fax 605-856-5401
	SISSETON WAHPETON COLLEGE	Sisseton Wahpeton College Diana Canku, President Agency Village Box 689 Sisseton, South Dakota 57262 605-698-3966 Fax 605-698-3132
American Indian Higher Education Consortium	AIHEC works to preserve and increase funding through the Tribally Controlled College or University Assistance Act and	121 Oronoco Street Alexandria, Virginia 22314 Phone: 703-838-0400 Fax: 703-

(AIHEC)	other relevant legislation, and to find new sources of funding throughout the Federal Government.	838-0388
Rural health and rural human services resources for South Dakota. **(Rural Assistance Center)**	Resources, outreach, training.	http://www.raconline.org/states/southdakota.php Director: Sandra Durick 600 E. Capitol Ave Pierre, SD 57501 Phone: (605)773-3366 Fax: (605)773-5683 Email: Sandra.durick@state.sd.us Website: http://www.ruralhealth.sd.gov
USD Center for Rural Health Improvement	Resources, outreach, training.	Sarah Patrick 1400 W 22nd Street

		SF 605-357-1500
Aberdeen Area Indian Health Service, PHS Indian Hospital, Rapid City	Health services, and research partnership.	3200 Canyon Lke Dr. Rapid City SD 57702 605-355-2500/ 2282 or Anna Marie Bosma Aberdeen
Northern Plains Tribal Epidemiology Center	Training, dissemination and research.	1770 Rand Rd Rapid City, SD 57702 Phone: (605)721-1922 Toll Free: 1-877-209-1215 Fax: (605) 721-2876 Attn: Christine Rinki epiromero@aatchb.org
Aberdeen Area Tribal Chairmen's Health Board	Health services, and research partnership.	**1770 Rand Road** **Rapid City, SD 57702** Phone: 1-800-745-3466 or (605)721-1922

		Fax: (605)721-1932 **Carol Ann Heart**- Rapid City SD 57702 -1-800-745-3466 - 605-721-1922
Flandreau Santee Sioux Clinic	Health services, and research partnership	P.O.Box 283 603 W Broad Ave Flandreau, SD 57028 Phone: (605)997-3891 Toll Free: 1-888-922-0016 Fax: (605)997-3878 Attn: Tracy Baum Email: info@fsst.org
Veterans Administration	Health services, and research partnership	Elizabeth Baure VA Black Hills Health Care Ft. Meade SF
Pine Ridge Indian	Health services, and research	Sherri Ann Moore

Health Services	partnership	P. O. Box 1201 Pine Ridge, SD 57770
Proyecto/ Project IDEAS	State, regional organization.Capacity building assistance for community based organizations, and state and local departments focusing on Hispanic populations. (primarily HIV related)	Debra Olesen, Regional Director **Telephone**: 303-262-4300 **Fax**: 303-262-4395
South Dakota Department of Education, Office of Educational Services and Support	Health education, prevention	**Janet Ricketts - Director** South Dakota Dept. of Edu 700 Governors Drive Pierre, SD 57501 Phone: (605) 773-3218 Main fax: (605) 773-6139 http://doe.sd.gov/supportservices/
Augustana College Department of Nursing	Training, dissemination and research.	Margot Nelson Department of Nursing Augustana College 2001 S. Summit Ave. Sioux Falls, SD 57197 **Phone:** Local 605-274-4721

		Toll Free 1-800-727-2844 (ext. 4721) **Fax:** 605-274-4723
Keya Program- Long life for good health.	To reduce overweight, obesity, and prevent diabetes, and to improve health status of people with diabetes.	Donna Keeler Executive Director South Dakota Urban Indian Health, Inc. 1714 Abbey Road Pierre, South Dakota 57501 Phone: (605) 224-8841 Fax: (605) 224-6852 E-Mail: donnak@sduih.org
Rural Chronically Ill Women- Women to Women	To help isolated women with chronic illnesses.	Clarann Weinert, SC, PhD, RN, FAAN Montana State University College of Nursing, Box 173560 Bozeman, MT 59717 Phone: 406-994-3606 Fax: 406-994-6020 email: cweinert@montana.edu
Mass Media communicators in SD		Public Broadcasting Radio and television Local/Towns radio broadcasting services

SD Urban Indian Health	Heatlh care services. Federal supported	Sioux Falls, Pierre/Ft. Pierre, and Aberdeen: 605-224- 8841
South Dakota Urban Indian Health	Health services, and research partnership	Donna Keeler http://www.sduih.org/programs/diabetes/sole/index.html Urban Indian Health 1714 Abbey Rd, Pierre
Indian Health Service Hospital, Rapid City, S.D.	Diabetes Control Coordinator Dr. Frederick K. Ness, M.D.	3200 Canyon Lake Dr Rapid City, SD 57702 (605) 355-2500 www.ihs.gov
Great Plain Public Policy Institute	Health services, and research partnership.	Great Plains Public Policy Institute PO Box 88138 Sioux Falls, SD 57109 Phone: 605.334.9400 E-mail: contact@greatplainsppi.org
Foundations – Resources		
Community Healthcare	Foundation. Non profit.	Paula Hallberg

Association of the Dakotas	Partners for PHC	1400 W 22nd Street SF 605-357-1515 Fort Pierre: 605-223-2262
American Diabetes Association	Training, dissemination and research.	Mark Stubbs Omaha, Nebraska
DAKOTACARE	Dissemination and research.	**DAKOTACARE** 2600 W. 49th Street P.O. Box 7406 Sioux Falls, SD 57117-7406 **Phone:** 605-334-4000 **Toll-Free:** 800-325-5598
SD Foundation for Medical Care	Training, dissemination and research.	Goldie Burnham 2600 W 49th Street Suite 300 SF 57117 605-336-3505

Juvenile Diabetes Research Foundation	Training, dissemination and research.	Gala Woitte (Tea) JDRF is active in our region. 1-888-533-WALK, or send an e-mail to info@jdrf.org
Union County Health Foundation	Training, dissemination and research.	Dianne Schreur Elk Point (605) 356-3317
W.K. Kellogg Foundation 2007 Rural people, Rural Policy Initiative Cohort	National initiative. Improve vitality of rural communities.	Headquarters: W.K. Kellogg Foundation One Michigan Avenue East Battle Creek, Michigan 49017-4012 USA Telephone: 269-968-1611 TDD on site Fax: 269-968-0413
Wellmark Foundation	Non profit. Partnership, funding, help local communities.	The Wellmark Foundation 636 Grand, Station 150 P.O. Box 9232 Des Moines, IA 50306-9232Matt McGarvey, Director mcgarveym@wellmark.com Phone: 515-245-4819 Fax: 515-235-4445
Wellmark Foundation	Increase capacity to deliver quality health programming in	http://www.wellmark.com/news/news_releases/110805_mini_grants.

Capacity Building Grant Program	SD.	htm Capacity-Building Grant Program The Wellmark Foundation Attn: Matt McGarvey PO Box 9232, Station 150 Des Moines, Iowa 50306-9232
Wellmark Foundation **Community Responsive Grant Program**	Improve community health in the areas of diabetes, depression, end of life and health literacy	http://www.wellmark.com/foundation/index.asp Matt McGarvey, Director mcgarveym@wellmark.com Phone: 515-245-4819 Fax: 515-235-4445
Blue Cross BlueShield Association **Of South Dakota – Wellmark** **Learning Collaborative sessions**	Use data collection tools to gather information to identify care opportunities. Partnership, health services, access, research.	Ann Skoglund, R.N., Isabel, SD Joel Hasenwinkel, Director of Clinical Collaboration at Wellmark http://www.bcbs.com/news/plans/learning-collaborative-helps.html
Great Plains Telehealth Resource and Assistance Center	Assist rural health providers, facilities and organizations to better utilize telehealth technology	Great Plains TRAC 800 East 21st Street PO Box 5045 Sioux Falls, SD 57117-5045

		(888) 239-7092 or (605) 322-6264 contactus@gptrac.org
Community based approach to Strengthening Rural Health Services	To make PHC available where and when needed.	Lisa Campbell Executive Director Bryan Schmidt Co-Director St. Bernard's Providence Hospital 901 East Virgil Avenue P.O. Box 423 Milbank, SD 57252 Phone: 605-432-4538 Fax: 605-432-5412
Dakota Network of Community Health Centers	Electronic Health Information Management Network with interactive video conferencing among Dakota Network Collaborating Organizations	Tom Olson, MPH, Director Dakota Network of Community Health Centers 605-332-7692 tmolson@dakotanetwork.org
Midwest Assistance Program (MAP)	State regional organization, helps rural communities improve quality of life.	Joe Dvorak, Regional Director for NE, ND, SD PO Box 95 Pickstown, SD 57367 Phone: 605.487.7006 Fax: 605.487.7214

Northern Great Plains Inc.	Foundation, non profit. Maximize the potential of communities in the region.	Northern Great Plains Inc Suite 201 4838 Rocking Horse Circle Fargo, ND 58104 Phone: 701.364.1349 Fax: 701.364.1350
HUD Community Development Block Grants: SD	Fed. Gov. funding for community development projects.	Mr. Steve Harding Governor's Office of Economic Development 711 East Wells Avenue Pierre, SD 57501-3369 Phone: (605) 773-5731

Discussion and recommendations

The main goal of the SD Diabetes State Plan, and the Diabetes Prevention and Control Program, is to improve diabetes heath care in the state by focusing on the essential services that are the foundation of public health practice and policy development. The current work addressed six selected objectives from the State Plan. This work involved faculty from South Dakota State University and the University of South Dakota, an SDSU graduate student, and advanced undergraduate nursing students. Faculty co-investigators and students came together to work in this project. This team work not only contributed to the implementation of the Diabetes State Plan to improve diabetes care, but also established new partnerships, increased awareness among graduate and undergraduate students of the role of public health in diabetes prevention and care, and encouraged young professionals from different health fields to become public health professionals and advocates.

The following limitations should be considered when interpreting the results of this project: 1) we were not able to interview all individuals with diabetes in the state, nor we were able to interview people with diabetes from all regions or areas of the state; 2) although the study could have been strengthened by interviewing a more heterogeneous sample (we included mostly Caucasian and American Indian participants) this is representative of the current population make up of SD; and 3) we were only able to assess services provided by 73 clinics across the state. In spite of these limitations the study was able to identify primary barriers to diabetes care and access and availability of specialty diabetes services across the state, as well as well as a number of current and potential future partnerships to the DPCP. This information contributes to a better understanding of the way diabetes specialty care is delivered, and identifies areas for improvement in order to reduce diabetes complications.

The results of this study suggest that there are some barriers to diabetes care in South Dakota. Through both clients and health professionals interviews the following main barriers to
diabetes care were identified:

a. *Health care service costs, and insurance coverage*
b. *Changing lifestyle and behaviors, lack of compliance with treatment and diabetes management plans*
c. *Lack of awareness among individuals with diabetes on the importance of adherence to self management programs, and about diabetes complications*
d. *Lack of transportation to access diabetes care and follow up*
e. *Lack of community awareness of the burden of the disease*
f. *Lack of community resources, such as support groups, diabetes education classes, nutrition education, and reduced access to fitness facilities and physical activities*
g. *Inconsistencies in diabetes education and support and among health providers*
h. *Lack of communication and collaboration among health care providers was also seen as a problem, especially for follow up care and coordinated care.*

The barriers most mentioned were related to cost of care and inability to integrate self-management and treatment plan into their everyday living. Additionally, our data indicated that the majority of patients were not consulted about their treatment plan and treatment options. Participants in the study did not feel that the healthcare team addressed the patient's values, beliefs and goals when developing the treatment plan. In addition, a majority of participants were not given written instructions for care or to attend classes regarding their diabetes, including nutrition information. Inadequate health insurance limited patients' ability to receive adequate specialty care referrals including eye exams, diabetes education, referrals to dietitians, and endocrinologists. According to our results

only 37% of the participants received diabetes education from a diabetes educator, and only 37% received nutrition education related to their diabetes by a registered dietitian.

These barriers correspond with the availability of diabetes specialty services in South Dakota. Although there are community and private clinics in most counties in South Dakota that provide services to people with diabetes such as laboratory tests, and health professionals visits and follow up, our findings show that dietitian and diabetes educator services, as well as eye exams and foot care are not offered on site. Most clinics have to refer their patients to a nearby hospital or larger clinic, which causes problems due to the rural characteristics of the state and the distribution of diabetes specialty care services. Additionally, diabetes services become fragmented contributing to the sense of lack of communication or miss-communication between health providers, and between providers and clients. Some race disparities found in the present study showed that American Indian individuals with diabetes report better diabetes care availability through the IHS than white population.

Suggested effective strategies to help improve the perceived barriers to diabetes care are listed in Table 19. Developing a collaborative relationship between healthcare providers will lead to more effective communication and a more thorough treatment plan. Encouraging patients to participate in group education classes will provide anticipatory information and helpful discussion about feelings and fears. Finding a support person within the patient's social network would help create a stronger self-management system. Patients would have a person to engage actively with them in education and management activities. Implementing a clear, effective questionnaire that can provide health habits, patient's traditions, values and beliefs will allow the healthcare team to create a well-rounded treatment plan. By offering a questionnaire that allows the patient a voice in their care will aid in the communication barrier between patients and provider. Developing and creating exercise and resource facilities for patients with chronic conditions will give them the opportunity to succeed at self-management. Many patients were concerned about lack of facilities within their community.

Based on the findings from this study, effective communication between patients and the healthcare team will help in managing the barriers faced by diabetic patients. Identifying individual barriers, creating a support structure, developing inter- provider relationships, and providing facilities and resources will lead to a better understanding and adherence to the patient's overall diabetes care. Focusing on the development of an electronic, integrated medical information system to help provide comprehensive, integrated diabetes care for each patient will improve efficiency and satisfaction of the provider and the clients, facilitating access, understanding and compliance with diabetes management. Although diabetes educator curriculum and certification process were not evaluated in this study, a shortage of diabetes education was identified. The promotion of diabetes education will help the patient's with their fears and concerns about living with diabetes. Future research could evaluate the provider-patient interactions and the impact it plays on overall diabetes care. In addition, studies also need to examine resource facilities that individualize educational programming and self-management interventions, and how to reach people with diabetes improving access to diabetes specialty care. Furthermore, and in order to plan for diabetes care services to reach more people with diabetes across the state, we need to compare and match the distribution and location of the services to the needs of the people with diabetes.

Table 19: Effective strategies and recommendations to reduce perceived barriers to diabetes care
Develop a collaborative relationship with healthcare providers.
Having a support person who gives encouragement and assistance to diabetic patients.
Participation in group education that encourages questions and discussion of feelings and fears.
Implementing a questionnaire to discuss values, beliefs and traditions before implementing a treatment plan.
Creating exercise and resource facility for chronic condition patients.

Although results show diabetes research is being done in South Dakota, we can conclude that more research efforts should be encouraged. Partnerships should be developed among the resources available within and outside the state, and resources should be allocated to increase the amount of research that focuses on the specific characteristics of the state and the needs of South Dakotans to reduce diabetes complications and improve health outcomes.

Current and future study findings will contribute to a better understanding of specific diabetes care needs of South Dakotans, and to assure quality improvement and better access to diabetes specialty health care to reduce complications among people with diabetes across the state.

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Letter

Barriers to Diabetes Care in the State of South Dakota

October 2007

Dear Participant,

We are inviting you to participate in a community project that is aimed at identifying barriers to diabetes care and implementing interventions to lessen or eliminate those barriers.

If you consent to participate in this project, nursing students from South Dakota State University (SDSU) under the supervision of Dr. Samra may ask you to complete a survey and answer few questions on your diabetes care.

Your involvement will require 15-20 minutes of your time. Your participation is voluntary. There is no harm, discomfort, or known risks linked to this project.

Your responses are confidential. Information gathered from this project may be shared with the South Dakota Diabetes and Prevention and Control program to help improve diabetes care in the state. Findings from this project also may be published in scientific journals and presented in scientific meetings. In no way will your personal information be linked to you. Protection of your identity will be at the top of our priorities.

Although there is no monetary compensation, we are excited about the possibility of improving diabetes care in the state.

Please assist us in this project. If you have any further questions concerning your rights, you may contact the SDSU Review Board (IRB) coordinator, Norm Braaten, telephone, 605-688-6975, email Norm.Braaten@sdstate.edu.

If you have any further questions, please feel free to contact us at any time. Our personal contact information is listed below. Thank you very much for your time

Sincerely,

Haifa A. Samra, Ph.D., R.N. Assistant Professor

College of Nursing South Dakota State University

Box 2275Brookings, SD 57007

Phone: 605-688-6345Email: Haifa.samra@sdstate.edu

Appendix #2

Summary of Endocrinologists' Responses

A1=Answer from endocrinologist 1

A2=Answer from endocrinologist 2

Q: What type of diabetic health education is offered in your practice?

A1: Print materials, one-on-one health counseling, and other.

A2: Print materials, language/cultural specific materials, one-on-one health counseling, recommended web-sites, and other.

Q: Is there as certified diabetes health educator available in your service?

A1: No

A2: Yes, we have a nurse and dietician that are certified health educators.

Q: Are diabetes care guidelines available and accessible in your service? If yes, whose guidelines?

A1: The guidelines are in my head, so they are my own guidelines.

A2: Yes. We use the American Diabetes Association guidelines.

Q: What percentage of time do you spend on diabetes care in your clinical practice?

A1: 25-50%

A2: Approximately 50%

Q: What percentage of time do you spend of diabetes prevention for at risk patients?

A1: <25%

A2: None

Q: Do you agree that health insurance coverage for your patients with diabetes is adequate?

A1: No. I don't think health insurance is even close to being adequate.

A2: No.

Q: How do most of the people you serve pay for diabetes care?

A1: Medicare and private insurance.

A2: Out of pocket, medicare, and private insurance.

Q: Compared to previous years, is the number of diabetic patients you've seen this year lower, about the same, or higher?

A1: Same

A2: Higher

Q: What do you think the biggest barriers in diabetic care are?

A1: Location of experts, monitoring the skin of diabetics, and cost of diabetic care.

A2: Cost, getting to the hospital or clinic, and lack of knowledge about diabetes.

Q: What percentage of your patients are non-compliant?

A1: 30%

A2: 35-40%

Q: Is there anything else that you would like to tell us that you think would help in our research?

A1: Not that I can think of.

A2: I have suggestions that I think would help patients better understand the disease. I think patients need to be referred to psychologists for behavior modification techniques. I also think diabetic patients should tour a dialysis unit so they know what those who don't control their disease go through.

Appendix #4

South Dakota
Diabetes Control and Prevention Program
Survey of Diabetes Education in
Health Provider Education Programs
Fall, 2007

Educational Program: Informants:

Type of Program:

Reviewer(s):

Standard	Findings, Notes, and Discussion
Standard I: Classification and Diagnosis A. Classification • 4 types B. Diagnosis	
Standard II: Screening for Diabetes A. Prediabetes B. Type 1 diabetes C. Type 2 diabetes	
Standard III: Detection and Diagnosis of GDM	
Standard IV: Prevention/Delay of Type 2 Diabetes A. Lifestyle modification B. Lifestyle or medication?	
Standard V: Diabetes Care	

A. Initial evaluation B. Management C. Glycemic control 1. Assessment of GC a. Self-monitoring b. A1C 2. Glycemic goals 3. Approach to treatment D. Medical nutrition therapy E. Self management education F. Physical activity G. Psychosocial assessment and care H. Referral for diabetes management I. Intercurrent illness J. Hypoglycemia K. Immunization L.	
Standard VI: Prevention and Management of Diabetes Complications A. CVD 1. HBP/BP Control 2. Dyslipidemia/Lipid Management 3. Antiplatelet agents 4. Smoking Cessation 5. CHD screening and treatment B. Nephropathy screening and treatment C. Retinopathy screening and treatment D. Neuropathy screening and treatment E. Foot care	
Standard VII: Diabetes Care in Specific Populations A. Children and adolescents	

1. Glycemic control 2. Screening and management of chronic complications in children and adolescents with type 1 diabetes 3. Type 2 diabetes B. Preconception care C. Older individuals D.	
Standard VIII: Diabetes Care in Specific Settings A. Diabetes care in the hospital B. Diabetes care in the school and day care setting C. Diabetes care at diabetes camps D. Diabetes care in correctional settings E. Emergency and disaster preparedness	
Standard IX: Hypoglycemia and Employment/Licensure	
Standard X: Third-party Reimbursement for Diabetes Care, Self-management Education, and Supplies	
Standard XI: Strategies for Improving Diabetes Care	

Summary of Overall Assessment, Strengths and Weaknesses:

Other Comments:

Appendix #5

To the participant: This survey is part of a SD Department of Health Grant. It is being used to identify availability of specialty care services for diabetics in South Dakota. It w ill also serve to locate populations who need diabetes services. Your name will not appear in the survey, and the information will be confidential.

Age: ___Occupation: _____ I am: Male - Female – American Indian – white – Hispanic – other - (circle) **I live on/in:** Farm Small town (<2500) Town (2500-14,999) City (> 15,000) (circle one) **County: _____**

1. How long have you had diabetes? _____ years, _____ months	**2. What is your blood sugar range? _____** **I don't know my sugar range _____**
3. Do you check your blood sugar at home? Yes, No (Circle One) **If yes, how many times a day? _____**	**4. How do you control your diabetes?** (Circle One) 1. with diet only 2. with insulin: H**ow many times a day? _____** 3. with oral medication: **How many times a day? ____**

5.What type of health care provider monitors yo **Diabetes?** (Circle all that apply) 1. Family Doctor 2. Diabetes specialist 3. Nurse 4. Physician Assistant 5. Nurse Practitioner 6. Other: _____ **How far do you travel to see your provider?____** m **Have you ever seen a diabetes specialist?** Yes, No (Circle One)	**6. Who educates you about your Diabetes?** (Circle all that apply) 1. Family Doctor 2. Nurse 3. Nurse Practitioner 4. Dietitian or Nutritionist 5. Diabetes Educator 6. Diabetes support group 7. Other: _____ **How far do you travel to receive the information?** _____ **How many times during the last year? _____**
7. How many times did you see your **health care provider during the last year?** (Circle One) 0-1 2-3 4-5 5 or more **7a. Have you had complications from diabetes?** (Circle all that apply) 1. Open Sores 2. Heart Problems	**8. I have had these tests in the last year :** (Circle all that apply) 1.Blood Sugar 2.Lipids 3.Eye Exam 4.Dental Exam 5.Hemoglobin A1C 6.Blood Pressure

3. Eye Problems 4. Kidney Problems Others: _____(describe)	7.Foot Exam 8. Influenza Vaccine **Have you ever had Pneumonia Vaccine**? yes -no (cir
9. Who covers the cost of your diabetes care (Circle all that apply) Self (own funds) - Medicare – Medicaid - IHS State Insurance - Veteran's Funds - Other:_____ **10. Has diabetes affected your employment?** Yes, No (circle one)	**11. Do you know someone with diabetes who does get care?** Yes, No (Circle One) **12. Where are they living?** **Town: _____** **County:_____**

Thank you for your participation!

Appendix #6 Data collection form – Specialty diabetes care services offered in the community

To: _____

In partnership with the SDDOH I am gathering information about diabetic care services available through agencies such as yours across SD. Below are four questions we talked about on the phone earlier. Thank you for agreeing to review them and provide the information we discussed over the phone. After you complete the questions you can either e-mail them back to (Cristina.Lammers@sdstate.edu) or call 605-688-5605, or fax them 605-688-6073.

Thank you for your time and expertise in assisting with the data collection.

1) Please describe the location of your clinics in SD, i.e. region, county, city, and neighborhood:

2) Please describe the scope of services offered related to diabetic care, e.g., dietitian, diabetes educator, endocrinologist, eye exam, foot care, FNP, MD, PA, lab tests (HbA1c, lipids etc.):

3) What is approximately the range of days and hours per week or month during which diabetic care services are available to your patients in the region, counties, served by your clinics?

4) Describe the manner in which a referral is made when needed:

_____

Most common indication for referral: _____

Feel free to forward any of these questions to any other person who you feel can assist with the information as well.

THANK YOU AGAIN FOR COLLABORATING IN THIS EFFORT.

Cristina Lammers MD, MPH

Associate Professor- SDSU- College of Nursing and Health Sciences- UPHP